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THE WILSON BULLETIN.

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No. 30.

Issued Quarterly by the Wilson Ornithological Chapter of the Agassiz Association.

WARBLER SONGS.

(*MNIOTILTIDÆ.*)

BY LYNDS JONES.

Subscription 50 cents a year.

Oberlin, Ohio, January, 1900.

Entered at the post-office at Oberlin, Ohio, as second-class mail matter.

COPY

An unabridged and unaltered reproduction
of the original issue

THE WILSON ORNITHOLOGICAL SOCIETY

November 1982

INTRODUCTION.

NEARLY six years ago the writer issued a call to members of the Wilson Ornithological Chapter of the Agassiz Association, to begin a critical study of Warbler songs (family *Mniotiltidæ*). The object of this call was to secure a mass of notes descriptive of the songs, from many sources, so that by comparison and tabulation a fairly accurate representation of each song could be put upon paper. It was also hoped that the diurnal as well as the seasonal song period of each species could be determined accurately, and that many other little understood phenomena might become better known. The author of the scheme of study well understood the wide lack of acquaintance among the class of lay ornithologists with the large majority of the family, and hoped that this might be a means of awakening widespread interest in our most beautiful and interesting group of birds. But the responses were few indeed, indicating that the difficulties were greater than could be overcome by the average bird student. Lack of time to devote to the swiftly passing migrants in the early days of May was undoubtedly one great obstacle in the way of many a willing worker.

Failing in this plan, but anxious to bring the host of Warblers closer to those who do not already know them by their voices, the writer has undertaken the task of bringing together all printed descriptions of Warbler songs at his command, combining them with such contributions as have been made in manuscript, and his own notes representing fifteen years of study, thus presenting what is known to him of the songs of the Warblers. On another page will be found a complete list of the works consulted, including books and periodicals. The writer fully realizes that this is far from a complete bibliography of the subject, but it will illustrate the resources at hand.

The task of bringing together such a mass of printed and

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manuscript descriptions has been second only to the task of determining in each case what must be allowed as a margin for the personal equation of the describer, and how much must be allowed for variation in the species. No intelligent comparison of the several descriptions could be made without a fairly satisfactory solution of these two difficulties. The method has been to select some species whose songs are clearly distinctive and not seriously variable. Three were selected: Oven-bird, Maryland Yellow-throat and Black-throated Green Warbler. The variation among the individual describers, when determined, will give the variation of the species.

There must be a large margin for mistakes allowed, particularly with the species whose songs are not personally known to the writer. A little study of ones notes in successive years will serve to show that we are prone to variations in our methods of representing the same songs from year to year, allowing as much as we please for variations of the individuals composing the species. The way our ears hear bird songs is often determined by our digestion. But there is always the possibility of finding an average for the whole series of notes. That has been the writer's effort in the body of the paper—to present the average of all notes of equal value.

Five years of teaching Ornithology in Oberlin College to all sorts of students, serve to show that descriptions of color patterns and habits are not adequate to the task of bringing this assemblage of small birds to the notice of the average person who becomes interested in birds. The song seems to be the missing link in the chain of acquaintance. Both the eye and the ear must be educated if one would learn the birds, and my experience indicates that the ear is the readier learner. Is that probably due to a tendency to color-blindness, or to weak eyesight on the one hand, and to a long series of unconscious ear training, on the other?

It is to the class of bird students who hope to find pleasure in acquaintance with the Warblers, rather than to those who already know them that this paper is addressed. It is hoped that by arranging the species in groups according to greater or less resemblance to each other it will enable the student to give special attention to one group before attempting the larger study of the whole group, thus some-

what simplifying the process of study. If this paper should prove of any assistance to lay ornithologists, and to those who find pleasure in casual notice of birds, the labor of preparing it will be fully repaid.

Acknowledgements are gladly made to Mr. H. W. Carriger, Sonoma, Calif. ; Mr. N. Hollister, Delavan, Wis. ; Miss Ethel Dane Roberts, Wooster, Ohio ; and Mr. Benj. T. Gault, Glen Ellyn, Ill., for valuable manuscript notes upon original field work. Particularly to Mr. Frank L. Burns, Berwyn, Pa., for painstaking study of several species not accessible to the writer, and for constant interest and encouragement when the future of the study looked dark and forbidding. Most of all are thanks due Professor Albert A. Wright for constant encouragement, and for patience and forbearance with me during "warbler time," when the many voices from the tree-tops proved more alluring than the duties which rightly called my attention away from the birds. Finally, it is with real pleasure that the writer reminds the reader of the close companionship, so often more than hinted in former numbers of this BULLETIN, between himself and Rev. W. L. Dawson, now of Ahtanum, Washington ; a fellowship to which the paper now presented owes far more than appears upon its pages.

While the serial arrangement of the species does not follow that adopted by the American Ornithologists' Union, the nomenclature does. The number following the name of the species will indicate its systematic position. It has seemed better to group the species according to their songs rather than according to their structural relationships. The geographical range, which always closes the discussion of each species, has been taken bodily from the A. O. U. Check List of North American Birds.

BIBLIOGRAPHY OF WARBLER SONGS.

THE following list of books and periodicals contains only those in which something of use bearing directly upon the subject has been found. General works on birds which contain no mention of Warblers are therefore excluded, but books treating the general subject of bird song, even tho they contain nothing specifically upon the warblers, are included. Neither here nor in the body of the report does it seem desirable to cumber the pages with exact references in the majority of cases. In many of the books the Warblers may readily be found in their systematic position, arranged in the accepted systematic order, and in nearly every book the index will prove a sufficient guide to the page from which the reference has been taken. With periodicals the case is somewhat different, and here specific references will be given where they seem necessary, in the body of the paper.

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Iowa Ornithologist, now Western Ornithologist. (D. L. Savage) C. C. Tryon, Ed. Avoca, Ia.

Museum, The. W. F. Webb, Ed. Albion, N. Y.

Nidologist. H. R. Taylor, Ed. Alameda, Calif.

Oologist, The. Frank H. Lattin, Ed. Albion, N. Y.

Ornithologist and Oologist. F. B. Webster, Ed. Boston, Mass.

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WARBLER SONGS.

IN the development of birds away from the primitive reptilian type, there has been; in general, a tendency to decrease in size as well as to structural modifications brought about by changing environment. In order to increase greatly in numbers there must be a decrease in size if the world were to contain the host. Along with decrease in size there seems to have developed a tendency to vocal expression, culminating at the present day in utterances second only to speech—song. We are unable to attribute to a bird's vocal utterances, however complex they may seem, more than a momentary state of feeling, unless it be taught by man. Only the smaller birds truly sing; the muscles of their syrinx enabling them to give utterance to varied notes instead of a monotonous repetition of the same note.

In the higher development of the Oscines—the singing birds—there naturally grew differences in song just as there grew differences in structure and habits, producing more or less well defined groups. We might reasonably expect that if a group be sharply marked off from other groups structurally its style of song would also be sharply marked; that it would possess a distinct song-type; and if there be gradations between groups there would naturally be gradations in song likewise. In general we find this to be true, but in particular there are exceptions. Thus, while the Warblers certainly possess a song-type it distinctly grades off to the Sparrows, which are not otherwise closely related to them. So we are forced to find and define the song-type and work both ways from it out to the limits, and there seek to distinguish certainly between the two which seem to grade into each other.

The warbler song-type may be defined as a high pitched, hissing whistle consisting of two well defined parts, usually on a different pitch. There are many and decided departures from this type, the one extreme being a monotonous repetition

of a single note like the Chipping Sparrow, the other a composite song so varied that it approaches a mimicry of many songs. I have selected the Yellow Warbler as representing nearly the type song of the family. We might further say that this type song usually consists of about eight syllables, the first phrase of four or five uttered more slowly, the remainder more rapidly and on a different pitch, sometimes higher, sometimes lower. With some species the pitch is so high that it approaches the vanishing point to many ears. But there is an indefinable woodsy quality to all warbler songs which is not shared by the members of any other group which bears any troublesome resemblence to the warbler songs. It is a quality that can be learned in a little time with the birds as they sing, but cannot be transferred by word of mouth or printed signs. Before leaving the song-type let me define the hissing whistle. It can be closely imitated by forcing the breath over the tip of the tongue as it is held against the upper teeth, modulating the pitch of the resulting thin whistle with the lips instead of with the tongue as in the ordinary direct whistle.

SONG PERIODS. DIURNAL.

Having learned the Warbler song-type, we are prepared to begin a study of the separate songs as the species pass in review before us. We shall not proceed far in this study before we discover that certain times of the day are preferred for singing by most of the species. Their day begins in the early morning twilight with a burst of song, and is carried with the quest for food as the light strengthens; the intervals between songs gradually lengthening as the day advances, until the appetite is satisfied, when the bird ceases song to rest until the afternoon brings round the feeding time again. The afternoon song period is marked by less singing than the morning, and the twilight marks its close. It is difficult to say when the morning period ends and the afternoon begins in the case of any individual birds; but in general, we hear few songs between ten in the morning and three in the afternoon, especially during warm weather, when the noon hours are of high temperature. During cool or wet weather the morning period begins later and the evening closes earlier, while some

birds will be in song all day long. But it must be remembered that some species do not follow any rule about their singing, and that with the majority of the species we know little about them except as they pass us on their way to the north. It may well be that the all night journey, as they migrate, makes the noon-day sleep necessary, while at their breeding grounds they have little need for that rest and so sing all day. But with many of the species which remain with us to nest there is the noon-day resting time all the season.

SEASONAL.

There are seasonal song periods as well as diurnal. These will be spoken of in the discussion of the several species, so that I need only discuss here the general subject.

Most male Warblers sing more or less during their northward journey, and until the care of the young leaves no time for song. Singing begins at least as soon as the northward journey begins, reaches its height while the mate is brooding over the eggs, then gradually declines as the cares of the family increase, ceasing entirely with the beginning of the molt which follows closely the complete development of the young into independent foragers. After the plumage has been renewed, some species have a short song period before leaving for the south again. It is difficult to say how large a number thus renew their song, but the writer's list includes twelve species positively identified, with several others about which there may be some doubt. It is more than likely that a far larger number sing at some time during the autumn months, either regularly or occasionally. Few songs will be heard, during this second song period, except in the early morning hours under favorable conditions. With some species the second song period is marked by a somewhat different song, and with many by a weaker one.

It is suggestive that the species which are known to sing during autumn are those whose color patterns are practically the same at all seasons, or at least not markedly different in fall from the spring dress. The spring song period is accompanied by enlargement of the reproductive organs, but the resumption of song in the fall is rarely so accompanied. It is not likely that all individuals of a species which has a second

song period sing then, but that a few do. Many are too fat to sing, and no doubt many do not sufficiently recover from the debilitating effects of the molt to sing.

It is not unusual to hear feeble attempts at song early in the autumn from not fully fledged birds, sounding like a bird whose vocal chords were unable yet to respond to the will. Gradually the song becomes more and more perfect as the days pass until it again becomes normal. Many times these are not young birds, but old ones just completing the molt. Disuse of the vocal muscles, or change due to the molt may account for these first unsuccessful attempts at song renewal.

TWO KINDS OF SONG.

We shall not proceed far in our study of Warbler songs before we are greeted with surprises. We shall find that all of the individuals of a species do not sing alike, and that the same individual is not always confined to one style of song. Sometimes the variations may be considerable, sometimes scarcely worth noting. We shall not proceed far in our study of these variations before we may be greeted to a fresh surprise in the form of a song wholly different from anything before heard from the bird, which cannot be forced under the designation 'variation.' It is something apart from the ordinary utterance, both in quality and quantity. The manner of utterance strongly suggests that this is a passion song. We are now forced to distinguish between what we have before considered the song of the species and this newly discovered song. For convenience the first one may be designated the

CALL SONG.

What do we mean by Call Song? It is the song which we hear commonly: the song of every day, uttered under no special stress of circumstances, as a sort of accompaniment to the usual activities. It is an announcement to all other birds within hearing, of the singer's whereabouts. It becomes a distinct mate call when the breeding grounds have been reached, if it could not be so considered before. After mating and the selection of the nest site it becomes an announcement of ownership and a warning to all trespassers. During

mating it is often a challenge or cry of defiance, and may sometimes become the battle cry when the fight is on. With some, possibly many, species it is used during courting as a love song, when it may be somewhat modified, thus approaching the passion song. It is always an announcement of some sort to some other birds, and may, therefore, be properly termed a call song. Not usually being reserved exclusively for the mate nor for himself, it might also be designated the altruistic song, as distinct from the egoistic or

PASSION SONG.

What, then, is the Passion Song? It is an outburst of melody of such richness and fullness, such thrilling ecstasy, that the singer is lifted into the air on quivering wings to pour out his melody without a pause until the inspiration has passed. The call song is the product of a deliberate purpose, but the passion song wants no purpose. It bursts forth unbidden. We have supposed that the passion song is purely a love song, intended only for the mate, since it is usually uttered only in seclusion and at times when vulgar ears are not supposed to be listening. There is little doubt that during the mating and nesting season it is a love song, but I have repeatedly heard the song of Oven-bird long after the young had left the nest and were no longer dependent upon their parents. I venture the suggestion that this song is induced by an overflow of energy which finds expression in this way. It is a sort of hymn of praise for the mere privilege of life. It is so far different in execution from the call song that there is no ground of comparison. The performance is a continuous thrilling warble with no plan nor suggestion of pause, accompanied by fluttering flight or swift dartings about an open space in the woods. The favorite time is just as twilight begins to cast its hush over nature; but it may be heard in the morning twilight, or sometimes during a dark, damp day when there are twilight conditions. Once I heard it from an Oven-bird on the approach of a thunder storm about nine in the morning. While the song is so unlike the call song, it may be a medley of the notes of that song, or begin with a few notes of the call song and close with a complete rendering of it.

I doubt if a hard and fast line can be drawn between the two styles of song, and I question if even now there are not some species whose call songs are not growing toward the passion song. Certainly some show a tendency in that direction, both in the modification of the notes of the song and the manner of utterance at stated times or under peculiarly favorable conditions. Some species manifestly employ the call song for love making without much modification. When the song is given during the chase after the female it is uttered in the throat or only faintly warbled by many species, as tho the attention could not be divided between the flight and the song, each needing it all.

The writer knows of only a dozen species who have a fairly distinct passion song. Preeminent among these stands the Oven-bird, so often mentioned above. It is not likely that these are all that sing so, since nearly every year hitherto has seen the list swelled. I would not be bold enough to say that all Warblers sing a passion song that is unlike the call song, but there can be lttle doubt that more than this dozen should be found to.

VARIABILITY IN THE CALL SONG.

To the most of us a Yellow Warbler is a Yellow Warbler be he number one or number one thousand in the list of individuals. We recognize no difference in the different individuals of a species in any limited region where we study. And it is true that the individual differences of color pattern, while sufficiently unlike to make a mistake among the birds themselves as to which is their mate unlikely, are practically alike to us. But it is not so universally true with the songs. A singer is not confined to one style of utterance, even under like conditions. I mean many species are not, possibly all. But some are far more variable than others. A common variation lies in shortening or lengthening the usual song by dropping or adding syllables. Another common method is the change of position of syllables that are somewhat different, or a change of accent. Sometimes a single syllabled song may become double syllabled, or vice versa. The closing cadence may either rise or fall at the pleasure of the singer. But these variations do not much affect the character of the song, nor

make it difficult to identify to any but the one who is hearing it for the first time. Another variation often indulged in by some of the more versatile singers is the substitution of one vowel sound for another. When this is accompanied with the variations noted above there may be some difficulty at first, but when the *style* of utterance is once learned variations are not deceptive, but rather pleasing for their variety. Each species has a style all his own which can be relied upon in any given locality, however variable his song may be.

There seems good evidence that there is also a seasonal variation, or a migratory variation. Some birds sing one style of song when they start from their winter homes for the north, another during the latter part of their journey, and still another when they are well settled for the summer. How universal this is I am unable to say. With some species the difference between the songs is decided, in others much less so. It would be interesting to know whether nesting birds of one species sing the same in all localities where they nest, or whether there is variation of much consequence. My own notes show only that with the few species which nest in Lorain county, Ohio, the songs of the birds which remain are somewhat different from the songs of those that pass further north. Do the Ontario nesting birds sing like the Ohio nesting ones? Probably.

Is there a longitudinal variation as well as a latitudinal one? If any probably far less marked. With some other species, notably the Dickcissel, there is a marked difference between the singing of the Iowa and the northern Ohio birds. If there is such a difference among the Warblers the notes at hand give no evidence of it. We might naturally look for some variability in the sub-species, growing into recognizable permanent differences, since they are variations in other respects from the species. But we might argue from this that since genera are assemblages of species which in some prehistoric time evolved from a common stock by differentiation, that therefore the songs of all the members of a genus should bear a closer resemblance to each other than to those of any other genus. Either this is not true, as we shall see, or else the present system of classification is wholly wrong; an unlikely supposition. Often species of widely separated genera resem-

ble each other more than species of the same genus. But it must be said that the closest resemblances anywhere found do lie within the genus, and between the species which are placed side by side in classification. An artificial key to the songs would therefore group the species as unnaturally structurally as an artificial key to their colors. But let us defer further discussion of variability until the study of the several species again brings it into prominence.

We have become somewhat biased, I am afraid, in our opinion that among the birds song belongs only to the males. In large measure that is undoubtedly true, but it is not universally true. The female Redstart sings at least one of the variations of the male, and I have heard a feeble song from the female Maryland Yellow-throat. The female Audobon's Warbler is said to sing. I have suspected the female Yellow-Warbler and the female Oven-bird of it.

DIFFICULTIES, AND METHOD OF PRESENTATION.

THE difficulties which one who attempts a description of the songs of the Warblers meets at the outset seem almost unsurmountable. First of all is the 'personal equation' of the describer as well as the 'personal equation' of the one for whom the description is attempted. This may be minimized by combining notes from many describers, thus securing a sort of Volapuk description, which will really be a generalized song possibly suggestive to most persons already familiar with the song, but practically useless to the novice. The writer's practice, where there is considerable difference in the descriptions, is to combine those that are alike into a type, and then illustrate each type. Where this is not done practical agreement may be assumed.

Another difficulty lies in the variability of individual birds composing the species. Without such variability there would be no progress of the species toward a more perfectly developed song. But the variation here is less of a hindrance to the intelligent understanding of a description than the difficulty stated above. Indeed, I am not sure but this difficulty is a blessing in disguise, for some one of the variations may fit the description for the learner, where an unvariable one would utterly fail.

The one great difficulty lies in the almost entire lack, among human signs and symbols, of anything to even approximately represent birds' voices. We can only suggest with the means at hand. Our systems of musical notation are wholly artificial and mechanical, theirs wholly natural and unhampered. Our ears have become so accustomed to certain fixed intervals in the chromatic scale that we are prone to regard them as absolute necessities to any sort of melody. But if that be not true, there yet remains the entire lack of characters with which to represent the avian music in terms of human music. The learner's first need, then, is to become accustomed to bird music experimentally. It is not necessary to know what species is singing;

that will follow in good time. Equipped with the knowledge of what bird music is, the student can go on to a study of the characters common to the members of some group, this in turn followed by study of the individual species. It is not at all necessary to know the songs of many species of a group before the group type is learned. The songs of a half dozen or less will be enough.

To appreciate the realness of these difficulties one need only scan the pages of a few books wherein bird songs are described. Taking each description at its face value we should be compelled to believe that there is no constancy to a song-type within the species. But these diverse descriptions are often descriptions of the same individual bird, sometimes written by different persons at the same time standing side by side. It simply illustrates the first mentioned difficulty: that we see things differently, hear sounds differently, call up the same impression differently, are differently impressed by the same thing; and, of course, represent the same thing differently.

In view of this it would be time and effort wasted to attempt a description of the melody in the song of each species. Rather let the effort go into a representation of the more mechanical production of the song. The melody can be hinted in word description, and more or less of it will appear if the attempt be made to reproduce the song from the description given.

THE METHOD.

There are objections to any system of representation, because each, and even all taken together, are wholly inadequate, but some method must be employed. The system most widely used is the system of syllables. The birds do not speak syllables, but our minds seem to need something of the sort to fix upon as a suggestion of the sort of sound produced. We seem to associate high pitched, shrill sounds with the vowel *e*, low whistling sounds with *o*, or *a* as in ah; terminal sounds not too high pitched become *u*. Short, high-pitched sounds are like *i* in it. The chief objection to this system probably lies in the great diversity of the vowel sounds, making uncertain what sound is intended. This may be obviated in large measure by agreeing what sound each vowel shall always represent.

In this paper *a*, *e*, *o* and *u* are long, but *i* as in it. Double vowels represent a prolongation of the note which the syllable represents. The consonants have the sounds which their position necessitates. In addition to syllables, a system of dots and dashes, which I have found valuable in field work, is given where greater clearness seems to be gained by its use. The chromatic scale has not been used enough in the printed descriptions, nor in my own field work, to make its use here practicable. It would no doubt prove of great value if used for every species, furnishing means for fairly exact comparisons, but when employed only here and there and for but a few species the gain over arbitrary characters would be slight.

The method employed for presenting the subject differs from that usually employed. Instead of treating the species separately and in systematic order, it has seemed better to largely disregard the systematic arrangement for the sake of grouping the songs according to similarities exhibited in method of delivery, expression, or what not. Assuming an evolution of song, the order within the group is, so far as practicable, from the most primitive to the most specialized. But where a type has been taken, the order is from the ones most similar to those most dissimilar to the type. This leads us to speak briefly of the probable origin of bird song.

Mr. Charles A. Witchell, in his book, "The Evolution of Bird Song,"* says in substance, that voice probably grew out of grunts and hisses accidentally uttered during extreme fright or during combat. These became call notes by bringing to the aid of the one in distress those of his own kind as helpers. Call notes grew into call songs by the repetition of the simple call notes, modification naturally following to produce, in time, a song more or less different from the call note. And I may add, the call songs have grown into passion songs by a process of still further modification induced by an overflow of physical and perhaps mental vigor at certain seasons, no doubt emphasized by the migratory habit of the larger proportion of the class. We cannot stop to follow out the steps in the development of bird song here. Those who desire to do so should read the book above referred to.

*THE EVOLUTION OF BIRD-SONG; | With | Observations on the Influence of | Heredity and Imitation. | By Charles A. Witchell. | London. | Adam and Charles Black. | 1896.

WARBLER SONGS.

THERE are, or were at the last count, fifty-seven species and sixteen subspecies of warblers accredited to North America north of Mexico. Of this number the writer has been able to find described more or less fully the songs of forty-six species, leaving eleven species yet to be studied. Of the subspecies it may be said that the songs are so similar to the songs of the species from which they have sprung that they are practically indistinguishable and so need not be counted in the final result. If there are exceptions I have been unable to find them.

These forty-six species (with their subspecies where any occur) can readily be divided according to the style of song, and the divisions subdivided, but it must be understood that this style of division plays havoc with the accepted systematic arrangement of the group. For convenience we may first distinguish two groups: Those with whistling songs; those with song otherwise. Treating the latter group first because it includes the more generalized species if not the more generalized types of song, the sub-group which seems naturally to stand first may be designated:

THIN, WIRY, HIGH PITCHED SONGS.

While this may seem an arbitrary and therefore unnatural group, it is convenient in bringing together songs which are readily over-looked amid the May medley of stronger voiced singers. If, as seems likely, this type of song is the more primitive one, the group is not an unnatural one.

Perhaps the only character strictly common to every member of the group as here constituted, is the high pitch of the song. Some songs are wiry, some insect-like, some thin without being wiry, but all are high in pitch—so high that some ears seem incapable of hearing them unless close at hand. But it does not follow that these songs are weak. On the contrary, some of them carry far, just as the shrilling of the cicada carries far.

Grouping within this group seems so impracticable that a treatment of the species separately in systematic order would appear more desirable.

Black and White Warbler. *Mniotilta varia.* 636.

The migrating song of this warbler is a thin, wiry sibilant of repeated single syllables, or a series of double syllables, ending, in both cases, with two shorter syllables. The one type is well represented by the syllables *tse tse tse te te;* the other by *ki-tse ki-tse ki-tse se se.* Not seldom the performance seems to consist of a series of closely connected syllables, like "*che-a-wee-a-wee-a-wee*" (Burns). The accent on the syllable "wee." In every double syllabled song the accent is on the second syllable.

Apparently the migrants sing but little and then fitfully. Some seasons none are heard singing at any time. It is one of the last warbler songs that most of us are likely to learn, unless the circumstances be more than usually favorable. According to Nuttall the latter, presumably the breeding, songs are decidedly mellowed and somewhat resemble some songs of Redstart.

During the migrations the birds are to be found in considerable numbers in almost any sort of woods, as well as in village and city parks and tree lined streets. They are not found west of the Plains, but are birds of the eastern United States.

Blue-winged Warbler. *Helminthophila pinus.* 641.

The ordinary call song of this species has a decided insect quality. He seems to inhale a shrill *zre-e-e-e-e-e* and immediately exhale a buzzing *zwe-e-e-e-e-e*, the whole performance comprising a perfect double run thru about half an octave of the scale. Often it seems to be a simple *zwe-e-e-e-e-e ze-e-e-e-e-e*, the latter part merely a sputter. At its best the song is a drowsy, locust-like shrill, belonging rather to mid-summer than to spring.

There is another song which is usually given during the early summer months, but which I have heard shortly after the arrival of the bird in the last days of Aprll or the first days of May. This song is far more varied and has a far

better claim to be called a song. Mr. Chapman renders it *wee, chi-chi-chi-chi, chur, chee-chur*. Mr. Burns reports still another: *che-de-de-e, che-e-de-de, che-de-de-dee*, resembling the Chickadee some what. These songs may possibly stand for passion songs, since they are far sweeter and more powerful than the other; but they are not flight songs.

There are two definite song periods, the first beginning with the bird's arrival and ending about the middle of June, during which time the insect song is given almost entirely; the second one beginning late in July or early in August and continuing to the third week in August, this period being characterized by the more varied song, but not to the entire exclusion of the other.

The Blue-wing delights in the second growth bordering uncut woods, where the ground completely dries only in midsummer. Here he perches on the topmost twig of some ambitious young sprout or high bush and sings his hours away. For his later song he seems to prefer a less conspicuous perch among the lower growth.

This is another eastern species, ranging west to Nebraska and Texas, and north to southern New England and Minnesota.

Parula Warbler. *Compsothlypis americana.* 648.

Parula's song is hardly wiry, but it is fine and delicate—more like hair than wire. The more delicate singers seem to say *pe-tse, pe-tse, pe see see*, with a slight accent on the second syllable of each phrase. A rendering less delicate and probably more commonly heard, Mr. Burns represents thus: *cher-re-re, cher-re-re, cher-re-re*, and *cher-er, cher-er, cher-er che-e-e-e*. This is heard often during the migrations. There is a tendency to an increase in volume to the end, the first notes being more softly uttered.

Mr. Bicknell recognizes two distinct songs. "In one, the notes coalesce into a fine insect trill; in the other, four similar notes are followed by four others, weaker and more quickly given."

It sings thruout its spring migration, and is sometimes heard during its return south. I have been unable to find any record of the time when its song closes at its breeding grounds.

Northern Parula Warbler. *Compsothlypis americana usneæ.* 648a.

The remarks on song are here given under the specific form for the sake of uniformity, but they really apply to the subspecific form. The Parula Warbler is the southern form, occuring in the south Atlantic and Gulf states, north in the interior to Mt. Carmel, Ill. ; the Northern Parula Warbler breeds along the norther tier of states and into Canada, and west to the plains. There is nothing to indicate that the songs of these two forms differ perceptibly.

Cape May Warbler. *Dendroica tigrina.* 650.

The lack of much definite imformation about the song of this warbler in the literature of bird songs, will attest the general rarity of the species. The only studied attempt at a description seems to be that of Prof. A. W. Butler in his Birds of Indiana. "*a-wit a-wit a-wit a-wit a-wit*, each pair of syllables repeated five times with moderate rapidity in the same tone, with no inflection." This description answers very well for the songs which I have heard if it be added that the effect is only less wiry than that of the Black and White Warbler. The birds sing on their northward journey but nave not been reported on their return south among the singers.

I have found more individuals in orchards than anywhere else. The only ones seen in Lorain County, Ohio, to my knowledge, have been in the orchards within the village. But they are known to flock with other members of the family in the woods.

In the nesting haunts the male seems to delight in mounting to the top of a tall tree and there pouring out his song while the female broods over the eggs in a low bush at some distance, thus misleading the nest hunter.

Another eastern species, west to the plains and north to the Hudson Bay Territory.

Cerulean Warbler. *Dendroica rara.* 658

Six different writers agree in their descriptions of this bird's song. It consists of two distinct parts, the first of several definite single syllables with a comma pause between

Bay-Breasted Warbler. *Dendroica castanea.* 660.

It has never been my good fortune to distinguish the song of this Warbler. Rev. J. H. Langille says of it: "The notes sound something like *tse-chee tse-chee tse-chee tse-chee*, but far too liquid to admit of exact spelling." While Mr. C. J. Maynard says of it: "It begins like Black-poll and ends like Redstart."

It seems to be a somewhat fitful singer during its passage north, and is silent on its return journey.

During the migrations it is not uncommon among the upper branches of the trees. I have seen it but seldom on the college campus.

Eastern North America, west to the edge of the Plains (Iowa, Missouri), north to Hudson Bay. Breeds mostly north of the United States.

each two, followed by a trilled syllable of about double the length of the first part. There is thus a marked resemblance to Parula's song. The syllables *tse, tse, tse, tse, te-e-e-e-e-e-e-e*, serve to recall it to mind. The song rolls up the scale quietly and evenly. The effect is less delicate than Parula's song, yet not more wiry. A larger song from a larger bird.

My notes indicate that this warbler sings from his arrival in the first week in May until the third week in May, and again during the last of June and first week of July. I have never heard it sing during the fall migrations and find no record of a song period then.

This is a bird of the interior of the United States between the Alleghanies and the Plains and north to Ontario.

SONGS OF STRIKING CHARACTER.

Under this heading are grouped those species in whose songs there is not only distinct individuality to so great a degree that resemblance to any other species is too faint to be considered, but in which there is a decidedly striking effect. It does not follow that the songs are loud; nor that they are always sharp and clear, but simply that they arrest the attention by reason of their individuality. Here, again, we are unable to arrange the group logically, so that we must fall back upon the systematic arrangement. First in order and probably also first in prominence is

Protonotary Warbler. *Prothonotaria citrea*. 697.

It is sufficient to say that Prothonotaria rings out a *peet, tsweet, tsweet, tsweet, tsweet, tsweet*, which sounds like the Solitary Sandpiper in the distance. One could hardly mistake it. It is high pitched, penetrating and startling. Mr. Nehrling calls him a fitful singer, but heard at all times of day and in all weathers. Mr. Nehrling also reports a passion song which is like the Oven-bird's passion song, reserved for select occasions only.

This is a water-loving species, frequenting low trees and bushes which hang over the water or which grow in swampy places. But there are many instances of more upland occurrence during the breeding season. In some regions at least,

the birds are familiar objects about the premises, and may also nest about bridges which are in constant use. Dr. Thomas S. Roberts has an interesting article in the July, 1899, *Auk*, in which he figures nests of this bird in a bridge over the Mississippi River opposite La Crescent, Minn.

I find no evidence of a second song period.

This Warbler is found over the eastern part of the country west to Kansas and Nebraska and north into Minnesota, breeding thruout its United States range.

Sennett's Warbler. *Compsothlypis nigrilora.* 649

The only note relating to the song of this Warbler that I have been able to discover is contributed by the discoverer, Mr. George B. Sennett. He says of it: "Its notes are so clear that they can be heard at a long distance, and are readily distinguishable from those of all other birds. There is thus a marked departure from the type of the other member of this genus.

In the United States this species is confined to the valley of the lower Rio Grande in Texas.

Black-throated Blue Warbler. *Dendroica cærulescens.* 654.

This bird's versatility is one of his chief characteristics. And the college campus birds seem to be rather more musical and more versatile than those in the woods. Here, on the campus, in one season, I have recorded the following variations:

tu, euu euu eeee-e-e, soft at first, loud and rattling at the close.
chweu chweu chweu, uniform thruout.
chw' chw' chw' chwee, the last syllable strong and full.
twe twe twe z-z-z-z-z } indistinct at first, gathering force
te zwee zwee zwee-e-e-e, } and closing high and shrill.
we we z-z-z-z-z-z, harsh and penetrating.

All writers agree that the song begins faintly, rapidly gathering force until the shrilling climax of the last syllable is reached. It is difficult to describe, but perfectly distinctive.

The spring migrants are with us for two or three weeks in May, singing during their stay, and returning in September when they rarely sing.

The birds love the underbrush in the woods, but remain well up in the trees on the campus where they associate with the other tree haunting species.

Another eastern species which ranges west to the plains and north to Labrador. The form which inhabits the higher Alleghanies has been described as

Cairns' Warbler. *Dendroica cærulescens cairnsi.* 654a.

The song and habits are likely identical with the species.

Golden-cheeked Warbler. *Dendroica chrysoparia.* 666.

This species is given this place on the strength of a statement that its song of '*tser, weasy-weasy-twea*', bears a resemblance to the song of the next species. The song is described by Mr. Nehrling as composed of soft notes. It also suggests some of the variations of Redstart.

It is a Mexican species which crosses into south-western Texas.

Black-throated Green Warbler. *Dendroica virens.* 667.

While there is great diversity in the descriptions of this Warbler's song, there is clearly evident in all the descriptions the one peculiar type of song. No better illustration of the diversity in hearing and interpretation could be afforded than this list of syllable descriptions. The syllables which best describe the type song to me are: *pe, te, che-o, te,* or *pe, te, che-to, che.* The enunciation is clear cut and the effect very pleasing. It is an unique song. In musical notation it would stand something like this: · · · . · Not seldom there is a double variation which might be represented thus: · · · . · . · In every case the third and fourth syllables, and in the second case the fifth and sixth also are tied together, the others being staccato. It is the one Warbler song that students beginning the study of birds hear and heed.

During its stay, this Warbler is decidedly common on the college campus as well as in the woods. It also ranges the village streets—overhead.

The birds are usually with us for the first three weeks of May, singing during the whole time. They return again in

September, but I can find no evidence of another song period then.

The range is the same as the other eastern Warblers, reaching the Plains in the west and Hudson Bay Territory in the north.

Townsend's Warbler. *Dendroica townsendi.* 668.

Of this western species Mr. Merrill says: "The song is like *de, de, de-de, de,* all especially the first three notes, like Black-throated Green. It is different later in the season."

Western North America, east to central Colorado, north to Sitka, Alaska.

Prairie Warbler. *Dendroica discolor.* 673.

The remarkable quaintness of this Warbler's song cannot be suggested on paper, unless Dr. Coues has done so in his remark that it is "Like a mouse complaining of the toothache." The notes seem to suggest *zee* syllables repeated six or seven times, deliberate at first, increasing to rapid at the close. It is perhaps sufficient to say that no one, not even the novice, could listen to the song without having his attention instantly riveted.

I find no notes regarding the length of its song period, nor as to whether it has a second song period.

The bird delights in thickets and brushy fields and pastures, or almost any treeless thicket.

It is another eastern species, ranging west to the Plains and north to Michigan and southern New England.

Macgillivray's Warbler. *Geothlypis tolmiei.* 680.

Rev. W. L. Dawson's description of this western species' song seems to fit the case, *sheep, sheep, sheep, shear, shear, sheep,* or *sheep, sheep, sheep, sheep, shear, sheep,* bearing a good resemblance to the song of Dickcissel.

It is a bird of the western United States, from the eastern foot hills of the Rockies to the Pacific coast, and north into British Columbia.

Hooded Warbler. *Wilsonia mitrata.* 685.

Mrs. Wright represents this Warbler's song thus: *che-*

weo-tsip, *tsip*, *che-we-eo*. While Mr. Chapman makes the bird say, "You must come to the woods or you won't see me." Rev. J. H. Langille recognizes a day song, *che-ree-cheree*, *chi-di-ee;* and a twilight song, *whe-ree-whee-ree-eeh*. The first three syllables of the day song are loud and bell-like, the next two uttered rapidly, the last with falling inflection.

According to Mr. Bicknell, the first song period closes late in June or rarely as late as early in July, the second during the fourth week in August. He recognizes the two sorts of song which seem to be of the nature of individual variation rather than two distinct sorts.

Eastern North America, west to the Plains, north and east to southern Michigan, southern Ontario, western and south-eastern New York, and southern New England. Breeds from the Gulf of Mexico northward.

SONGS RESEMBLING THAT OF CHIPPING SPARROW (AND JUNCO).

The common character of this group is the trilling. Some of the songs are decidedly shrill and almost wiry, but lack the distinctive characters of the first group. Some are fairly round and full, but could not properly be designated whistles. Some are somewhat striking in character, but all are distinctly trilled. It must not be understood that the songs necessarily bear a close resemblance to the monotonous trill of the Chipping Sparrow because that species has been used as a comparison, but simply that the sparrow is the bird most likely to be most generally known. The order adopted in this group will be from the closer to the less close resemblance to the song of Chipping Sparrow, which is a trill or twitter of successive chipping syllables, monotonous, high pitched and weak in utterance.

Worm-eating Warbler. *Helimintherus vermivorus.* (639).

Song of the Chippy quality, but weaker, and bearing some resemblance to that of Junco. Mr. Burns describes a song that resembles that of Goldfinch: *chat-ah-che-che chee-chee-chee*, which seems to correspond well with a passion song in the manner of utterance.

The favorite resort of this bird is a dry, wooded, moderately rough region, where the brushy hillsides and ravines furnish a cover. He sometimes ventures into the open also.

This Warbler sings from his arrival in early May until the end of the first week, rarely into the second week, of July. Mr. Bicknell records a second song period during the latter part of August.

Eastern United States, west to Nebraska, north to southern New York and New England. Breeds throughout its United States range.

Bachman's Warbler. *Helminthopila bachmanii.* 640.

According to Mr. O. Widmann, this Warbler, the Worm-eating, Junco and Chipping Sparrow sing remarkably alike. But the song of Bachman's Warbler is shriller than that of Chippy instead of being weaker. There is a little unconfirmed evidence that it also has a passion song. Mr. Brewster describes the migrating song as resembling that of Parula Warbler.

I find no evidence of a second song period.

While migrating it keeps well to the treetops, but Mr. Widmann found the breeding birds in the St. Francis region of Missouri singing in the trees perched rarely higher than forty feet. His paper on the finding of the first nest of this species, in the *Auk*, Vol. XIV, page 305 to 309, is an admirable account of the habits of the birds.

Hitherto Bachman's Warbler has been assigned to the south Atlantic States (southern Virginia and Florida) and westward to Louisiana, but Mr. O. Widmann's labors have extended its range into south-eastern Missouri.

Golden-winged Warbler. *Helminthophila chrysoptera.* 642.

The monotonous is emphasized in this bird's song by its being lazily and and drawlingly uttered. It is an unmusical song. Mr. Samuels has described it: *zee-zee-zee-zee-zee.*

There seems to be nothing relating to the length of the song period, nor whether there may be a second one.

The bird haunts the scrubby second-growth, or even the

borders of dense woods, but when singing prefers the tops of the taller trees.

Eastern United States, north to southern New England, southwestern Ontario, and southern Minnesota, breeding only in the northern parts of its range.

Tennessee Warbler. *Helminthophila peregrina.* 647.

The song would be scarcely distinguishable from that of Chippy but for the first two syllables, They are not the ordinary "chip," but more like "twip." There is also a tendency to acceleration and increase in volume as the song proceeds, in this also being unlike Chippy.

It arrives during the first week in May and tarries well into the third week, singing during its stay. There is no second song period on its return, about the middle of September.

My experience indicates that this Warbler is far more common in orchards than anywhere else, particularly orchards in the middle of village blocks. Comparatively few are met with in woods. Others, however, in other places, find him commonly in the woods with other Warblers.

Eastern North America, north to Hudson Bay Territory, breeding in the northern parts of New York and New England northward.

Hermit Warbler. *Dendroica occidentalis.* 669.

The song is a penetrating twitter, harsher and more run together than that of Chippy. Mr. Chester Barlow describes the song thus: *tsit tsit tsit tsit chee chee chee*, the first four syllables gradual and of uniform speed, ending quickly with *chee chee chee.*

There is no mention of the length of the song period, nor of a second one.

This species ranges from the Rocky Mountains to the Pacific coast and from Washington southward.

Pine Warbler. *Dendroica vigorsii.* 671.

Mr. Chapman says of the song of this Warbler, that the southern ones sing like Field Sparrow, but the northern ones like Chippy. I have heard but one sing, and his song

closely resembled the song of Chippy, but was higher pitched and more deliberate.

The birds probably sing during their stay in the migrations, but I find no record of a renewal of song on the southward journey.

Eastern United States, west to the Plains, north to Manitoba, Ontario and New Brunswick.

Palm Warbler. *Dendroica palmarum.* 672.

The trill remains as a prominent feature, but the note is no longer a true chip. Better *tsee tsee tsee tsee*, with a distinct swell. Each syllable should be given a half double utterance except at the middle of the swell, where the greater effort seems to completely coalesce the half double quality into one distinct syllable. There is a little similarity to the song of Myrtle Warbler, but lacking the liquid quality of that species.

The Palm Warbler arrives late in April and tarries well into the third week of May, singing fitfully the while. He returns again in the second week of September, but does not sing.

The Spring setting for this Warbler is a low, damp or wet woods with a profusion of undergrowth.

This specific form occupies the interior of the United States, north to Great Slave Lake. Rare in the south Atlantic States during the migrations. While the

Yellow Palm Warbler. *Dendroica palmarum hypochrysea.* 672a.

Occupies the Atlantic States, north to Hudson Bay. This sub-species, from all I can learn, does not differ in song from the species.

Myrtle Warbler. *Dendroica coronata.* 655.

There is some variation in utterance with this species, but the general effect is a trill or twitter, therefore bearing a closer resemblance to the Chippy than to any other group. The syllable *tswe* repeated several times gives a fair idea of the quality.

The Myrtle Warbler is with us from the third week in April until the third week in May, singing constantly; and

again throughout October, when no song has been heard nor reported.

Except when Myrtle bushes entice him away, the Myrtle Warbler keeps well to the higher woods during the vernal migration, but seems just as partial to fields during the return.

This is a bird of North America, chiefly east of the Rocky Mountains, breeding from the northern United States northward. A Pacific coast form has been described as

Hoover's Warbler. *Dendroica coronata hooveri.* 655a.

Audubon's Warbler. *Dendroica auduboni.* 656.

Dr. Coues states that the song of this species closely resembles the song of Myrtle. Without describing it Mr. Merrill states that the male has two distinct songs, and that the female sings.

The species replaces the preceding one west of the Rockies, north to British Columbia. It is accidental east to the Atlantic coast.

Black-poll Warbler. *Dendroica striata.* 661.

In execution the song resembles that of the Myrtle—all in the same pith and containing a perfect swell, but sounds more like "striking two pebbles together," therefore lacking the liquid quality of Myrtle. There are two renderings, the more musical one containing a prelude of three or four distinct notes, like *tsip tsip tsip*, followed by a twittering *tsee tsee te*. The other song is merely a twitter.

The Black-polls arrive late and make but a short stay, singing the while. They have no song period on the southward journey.

They remain well up in the trees, and seem rather partial to the woods to the almost entire exclusion of parks.

Nearly the whole of North America east of the Rockies, and to Alaska and Greenland. Breeding from northern United States northward.

SPECIES WHOSE SONGS RESEMBLE THAT OF YELLOW WARBLER.

Considered according to the manner of utterance this is a

fairly satisfactory group, and as to quality of tone there is evident correspondence, but beyond these it is an unsatisfactory arrangement. The four species which sing alike in many ways may perhaps be sub-grouped by themselves, leaving the remaining four in another sub-group.

This type of song has a marked singleness and earnestness of purpose which at once arrests attention. The song is not given as a sort of afterthought, or a thing of secondary importance, but it requires a pause in the other activities until the lay is finished. The syllables are clear cut, and the song has a distinct beginning and as distinct an end. It is complete in itself. The earnestness of utterance often becomes vibratory, approaching the passionate, yet distinctly non-passionate in style.

All of the songs are high pitched, but clear and smooth, just too high to be called a shrill whistle. They are simple songs, every one, yet with a distinct touch of sweetness that makes them pretty. Perhaps no better idea of the style of this song-type can be given than by a careful description of the song of the

Yellow Warbler. *Dendroica æstiva.* 652.

While there is no little variability there is little likelihood of confounding any of the variations with other species. Now it is *sweet sweet sweet sweet sweeter sweeter*, now *sweet sweet sweet sweetie*, again *wee-chee*, *we-chee*, *wee-i-u;* once more *wee-chee*, *chee*, *chee*, *chur-wee*. Over all presides the bird's distinct individuality. In all the variations I have heard the penultimate syllable is at a higher pitch, if the last phrase be three syllabled, lower if the last phrase be two syllabled. There is also a tendency to an increase in cadence to the last. The whole song is forcible and loud, but smooth and pleasing. It will be seen that in each variation there are two parts, though the last may be but a double syllable.

There is no second song period, because singing does not cease until the last of July or the first week in August. It should be remarked, however, that there is a marked decrease in singing after the middle of July, at least in northern Ohio. Sometimes individuals are heard singing after the middle of August for a few days.

This Warbler's haunts are even more distinctive than his song. He frequents brushy woods and low gardens which abound in small shrubs, and is a well known orchard singer. But his favorite nesting place is a swamp tangle of small trees, bushes, vines and weeds. He does not hide in the foliage while singing, as some others do, but mounts to the top of some conspicuous tree or bush and makes a business of it. He is not to be seen within the taller woods, but about its edge in the fringing brush.

In southern Arizona, western Texas and north-western Mexico this species is represented by

Sonora Yellow Warbler. *Dendroica æstiva sonorana.* 652a.

And in the coast region of Alaska by

Alaskan Yellow Warbler. *Dendroica æstiva alaskensis.* 652b.

Otherwise the true Yellow Warbler may be found in North America generally, breeding nearly throughout its range.

Chestnut-sided Warbler. *Dendroica pennsylvanica.* 658.

While the resemblance to the Yellow Warbler is certainly close in many respects, the song is distinctly weaker and usually shorter, uttered with less vehemence. Miss Ethel Dane Roberts' description is happy: "*tsee tsee tsee*, happy to meet you." To my ear the syllables *te te te te we chu* are the most suggestive. But allowing just a little for poetical license in Miss Roberts' rendering, there is no difference at all. In both the next to the last syllable must be given a third higher than the others, which are all on the same pitch . . . . . would suggest the same arrangement. The song is often shortened at either or both ends, but six syllables seem to be the limit. It is refreshing to find such uniformity of description among writers. Nowhere is there greater discrepancy than in the two descriptions given.

This Warbler arrives about the first of May and remains two or three weeks, singing during his stay. On his return in September he is silent.

The Chestnut-side also frequents brushy places, but more wooded ones where the brush forms an under-brush. He shuns swamps, for the most part, as well as villages, preferring the woods; yet he regularly visits the college campus—that Mecca of the Warbler host.

His range is eastern North America, west to the Plains, and north to Manitoba and southern Ontario, breeding in the northern part of the range.

American Redstart. *Setophaga ruticilla.* 687.

In general tone and quality there is a strong resemblance to the Yellow, but the range of variation is greater, and the song distinctly belongs to the "ringing aisles" of the woods. The commoner utterance can be recalled by *che che che che-pa*, the last syllable abruptly falling and weakening. A soft, sweet song is like *wee-see*, *wee-see-wee*, with a suggestion, at least, of lower pitch for the last syllable. Mr. Chapman represents a strongly accented song by *ching ching chee*, *ser-wee*, *swee*, *swee-e-e-e*. The fundamental difference between this bird's song and that of the Yellow Warbler is that there is a tendency to acceleration in the Yellow, while there is always a retard in Redstart. But even more distinctive, the two are not found in the same situations. Redstart builds him a house within the woods, singing to the accompaniment of his own echo.

It is well known now that the female of this species sings at least the more simple of the variations. I have never heard her sing the *staccato* described by Mr. Chapman.

My observations all point to continuous song from the early May arrival well into August, but Mr. Bicknell has found that there may or may not be a period of silence in July, followed by a second song period in August.

The Redstart inhabits the whole of North America to Fort Simpson, west regularly to the Great Basin, irregularly to California. It breeds from the middle of the United States northward.

Magnolia Warbler. *Dendroica maculosa.* 657.

Here the song differs from Yellow Warbler in ending in a falling inflection and from the Redstart in having the first

part distinctly double syllabled. I am now speaking of the commoner songs. There is such great variation that one is at a loss how to make comparisons. During the few days of migration I have already distinguished five variations, while Mr. S. E. White, in the Auk, describes seven. Rev. J. H. Langille distinguished the three types for three stages of the migration northward. In the south the song is a soft *whee-cho, whee-cho, whee-cho, whee-cho;* in the north it is *chee-to, chee-to, chee-te-ee;* while the breeding song is *cree-e-e-e-e-e.*

To Mr. Galloway the song suggests a "twisted caterpillar."

Mr. White's seven variations are well worth reproducing here.

1. Three notes, followed by one lower: *che-weech che-weech che-o.*

2. Three sharp clear whistles with a strong sound, then a warble of three notes, the middle the highest, the latter clear cut and decisive: *pra pra pra r-e-oo.*

3. Two quick sharp notes, followed by a warble of three notes, the middle the highest; the warble is soft and slurred: *prut prut purreao.*

4. A soft falsetto warble, different in tone from any other bird song: *purra-e-whu-a.*

5. Of the same falsetto tone, uttered rapidly: *prut-ut-ut-ut-ut.*

6. A harsh note like, in miniature, the cry of a Jay: *d kay kay kay.*

7. A harsh *k-e-e-e-dl*, the last syllable higher by a shade, quick, and subordinated to the first part. The alarm is a sharp *zeek.*

These fully cover the five which I have heard. The first is distinctly like the Yellow Warbler.

This species sings during its stay in spring, but I find nothing to indicate that it sings on its return journey.

The species inhabits the spruce and hemlock woods when breeding, but in the migrations it is found in any woods, and not seldom in village parks.

Eastern North America, west to the base of the Rocky Mountains and north to Hudson Bay Territory, breeding mostly north of the United States.

The remaining four species may be regarded as forming a transition to the Chipping Sparrow Group, the transition being most marked in the last species to be described under this heading. Yet it must be borne in mind that these species in no small sense belong to this group, all of them, rather than to the other one.

Canadian Warbler. *Wilsonia canadensis.* 686.

Without being very marked, there is a certain similarity to Yellow Warbler. The pitch is higher, lending a shrill effect, the song averages shorter, or if longer there is a distinct swell or small run, before the end instead of at the end. – – – – – – – might serve to represent it. Or – – – – – The syllables I have written are *tu tu tswe tu tu*, the long syllable being higher pitched. Retaining this general character, the song may be lengthened or shortened. Mr. Thompson's *rup-it-chee, rup-it-chee, rup-it-chit-it-lit* must be a variation of rendering which I have never heard. The style of utterance suggests both the Yellow Warbler and Goldfinch.

The birds keep well to the trees, but are common on the college campus as well as in the woods. They seem to rather prefer the smaller growths.

Singing during its stay in spring, but silent in fall.

Eastern North America, west to the Plains and north to Newfoundland and Lake Winnipeg.

Orange-crowned Warbler. *Helminthophila celata.* 646.

The song is full and strong, not very high pitched, and ends abruptly on a rising scale. My note book renders it *chee chee chee chw' chw'*. The first three syllables rapidly uttered, the last two more slowly. One heard late in the season sang more nearly like Mr. Thompson's description: *chip-e, chip-e, chip-e, chip-e, chip-e*, but with the first vowel changed to *e*, thus eliminating what would appear to be a marked similaaity to the song of Chippy. Even in this song the ending is retained.

The Orange-crown sings while migrating northward, but I find no evidence of any song during the southward movement.

One must look for this bird in the bushes fringing woods,

Blackburnian Warbler. *Dendroica blackburniæ.* 662.

We might reasonably expect this rather large Warbler to favor us with a robust song. On the contrary, he seems unable to produce more than a shrill, thin song, which runs up the scale to end in a high *z*. I can recall it by the syllables *tswe tswe tswe, te ze ze z-z.* Mr. Minot detects some difference between the spring and summer songs. The summer song is a repetition of the syllables *wee-see*, with the accent on the second; while the spring song is more ambitious: *wee-see, wee-see, tsee-tsee, tsee, tsee, tsee-tsee, tsee, tsee*, ending shrill and fine. While the song differs in execution from the Yellow Warbler it yet retains somewhat of that character, and should form the beginning of the transition to the Chippy type.

Blackburnian is not a persistent singer, and may sometimes pass northward in almost silence. He has not been heard singing during the return journey.

This promethean presence gleams from the upper foliage of trees, but delights in the shade trees of parks and lawns fully as much as the wood-land, usually shunning the deeper woods. His is a familiar presence on the Oberlin campus during the early days of May.

Eastern North America, west to eastern Kansas and Manitoba, breeding from the northern United States northward to Labrador.

or in the dense undergrowth of woods, where he conceals himself when singing.

Eastern North America, breeding as far north as the Yukon and Mackenzie River districts. Rare east of the Alleghanies, north of Virginia.

In the western United States, from the Rocky Mountains to the Pacific, the species is represented by the

Lutescent Warbler. *Helminthophila celata lutescens.* 646a.

And on San Clemente, Santa Cruz, and Santa Rosa Islands, California, by the

Dusky Warbler. *Helminthophila celata sordida.* 646b.

Wilson's Warbler. *Wilsonia pusilla.* 685.

There is a variability in this Warbler's song which lies wholly within the group. Miss Roberts has summed it up in the following sentence: "It is sometimes like the ordinary song of Yellow, sometimes more like Redstart, sometimes almost unaccented." But it is always shriller than either, besides showing a tendency to marked *z* sounds. Mr. Nuttall describes it by the syllables *ts tsh tshea*, which strongly suggest a short song of Yellow Warbler. It is a small song, both in volume and quantity.

This black-capped Warbler sings during his northward journey, and I have heard weak songs on its return in autumn.

Brushy underwood is its favorite haunt, occasionally going higher up in the trees. It seems partial to places near water.

Eastern North America, west to and including the Rocky Mountains, north to Labrador, Hudson Bay Territory and Alaska. Breeds north of the United States chiefly.

From the Great Basin to the Pacific and north to Alaska the form is

Pileolated Warbler. *Wilsonia pusilla pileolata.* 685a.

Nashville Warbler. *Helminthophila rubricapilla.* 645.

There is considerable variation in execution of the song,

some renderings approach closely to the song of Yellow Warbler, while others resemble Chipping Sparrow. This is the pivotal species of the transition from one group to the other. Those which resemble the Yellow Warbler type are halting and less rotund. Mr. Minot represents this type by the syllables *wee-see, we-see, wit-a-wit-a-wit.* Rev. J. H. Langille by *ke-tse, ke-tse, ke-tse: chip-ee-chip-ee-chip-ee-chip,* which satisfies my ear better. Mr. Galloway also well represents it by *ka-cheepa cheepa cheepa cheepa, pichepe chip;* the transition syllable from the first to the second part of the song is admirable. The more Chippy-ward song may be represented thus: *k-chip; k-chip; k-chip; k-chip: che-che-che-che.* The manner of utterance is also transitional, but the whole song is on the same pitch.

The Nashville spends little more than the first two weeks of May with us, singing constantly, but on his return he is silent.

I have found this Warbler everywhere that trees are growing, but rather more numerously in moderately brushy woods than elsewhere. There he ranges rather low, but spends much time in the trees.

Eastern North America, west to the Plains, north to the Fur Countries.

West of the Rocky Mounains it becomes

Calaveras Warbler. *Helminthophila rubricapilla gutturalis.* 645a.

WHISTLING SONGS.

Of the Whistling songs little need be said in general, except to define what we mean by whistling. True, there are a good many different kinds of whistles. Well, this is none of them. You make it yourself: pucker your lips and blow! That's the kind! The types selected are the Cardinal and the *pe-tee* whistle of Chickadee. Here, again, we clearly recognize a few transition species which it seems best to place last.

The group is readily subdivided into two sub-groups: Yellow-breasted Chat, all others. Giving them this order, we may first treat

Yellow-breasted Chat. *Icteria virens.* 683.

The song of the Chat is unique, not merely in this group, but in the whole class of birds. It is ventriloquil to a marked degree, but it possesses a timbre all its own. It would be far more proper to call the Chat's a performance rather than a song. To the uninitiated he appears to imitate every other sort of bird in the woodland, from the Crow and hawk to the sparrows; but to one familiar with him the Chat appears in it all. The imitation is not perfect, but approximate. Mr. Burns gives the best syllabled description of the describable part of the performance that I have seen: *cop! chick! cock! chack! co-co-co-co-co-co.*, the first softly, second, third and fourth emphatically, the remainder loudly and rapidly. There is usually a considerable pause between each of the first four syllables. There is endless variation in the performance, but these syllables are conspicuous and form a large part of the so-called song proper. While the Chat's range of imitation embraces nearly every voice of the woodland, he does not attempt an elaborate imitation, but rather snatches here and there from such parts as best suit his purpose.

The "flight song" of this species is apparently not a passion song at all, but rather comparable to the broken wing tactics of so many birds, or to the pitiful undone flutter of Killdeer, since danger seems necessary to call it forth. You have been cautiously searching hither and yon for a bird that ought to be attached to that voice, but all in vain, when you suddenly become aware of a loose bundle of feathers apparently suspended in the air above you, jerking like a witch and gradually settling down; while the air seems filled with a most bewildering medley of every sort of bird voice. You are too near his nest.

While performing, the bird remains well concealed high up in the foliage of some small tree, or in a thicket, but he will unmask if approached unawares. He is wary and alert. His favorite haunts are the brushy thickets bordering woods, or brier thickets with a few small trees.

He is one of the few night singers, singing at all hours of the night, but less frequently from twelve to two. It is no dreamy performance, but a wide-a-wake intentional song that rings and rings again on the still air.

He is singing when he arrives in the first week in May, and does not cease until the last of July or first of August. He has no second song period.

This species occupies nearly the whole of the United States to Ontario and southern New England, west to the Plains; west of the Plains to the Pacific it becomes

Long-tailed Chat. *Icteria virens longicauda.* 683a.

The remainder of the group need not be definitely subdivided. The transition species will be mentioned when they are treated. For lack of any evident logical order, we may begin with the best known species.

Oven-bird. *Seiurus aurocapillus.* 674.

The well-known double syllabled cry of this bird would scarcely need more than mention were it not that there is honest difference of opinion regarding the place of accent. As Mr. Chapman has well said: "It is a long, ringing creschendo chant, to which Mr. Burrough's description of 'teacher, *teacher*, TEACHER, TEACHER, *TEACHER*,' is so applicable that no one would think of describing it in any other way." The accent must evidently be upon the first syllable. The birds that I have heard have persisted in accenting the second syllable, the first one being weak and short: *p*'-CHEE. But this difference is rather technical than fundamental, since any one could readily identify the bird by Mr. Burrough's description. The description of the passion song will be deferred so that the "Water Thrushes" may be treated together.

The birds arrive very near the first of May, usually many together, and are singing. They sing well into the middle of July, but after the third week of June there is a marked waning. Song is resumed, but less vehemently, in August, usually ceasing before its close. Very few songs are full and strong during this second period.

The accompaniment of the Oven-bird's chant is a high, damp to wet woods where the upturned roots of fallen trees leave hollows for little ponds to form.

North America east of the Plains, north to Hudson Bay Territory. The breeding range extends from Kansas, the Ohio Valley and Virginia northward.

Water-Thrush. *Seiurus noveboracensis.* 675.

I shall not soon forget the anxious days and nights that this water sprite caused me before I could rightly say that I had seen him singing. The song was burned into my memory: *sweet sweet sweet chu-chu-wee-chu.* . . . . . The first three syllables strongly accented and staccato, the last four short and run together into one phrase, the next to the last a third or more higher. Occasionally one sang *to to che-we che-we che.* . ···· ···· ··· The first two indistinct, the third, fifth and last strongly accented and a sixth higher, the fourth and sixth a little lower than these. Both songs are high pitched, clear, liquid whistles that carry far.

The Water-Thrush comes to northern Ohio near the first of May, and sings during his stay of three weeks. On his return early in September he is singing as vigorously as when he departed, for aught I can tell.

I have heard the song only in wet brushy places, preferably low woods or brushy clearings. The bird has sometimes been seen in wooded uplands. One regularly visits a wet tangle well within the village of Oberlin.

From Illinois eastward, north to Arctic America. From Illinois west to the Pacific coast the form becomes

Grinnell's Water-Thrush. *Seiurus noveboracensis notabilis.* 675a.

Louisiana Water-Thrush. *Seiurus motacilla.* 676.

The ordinary song is, to my ear, a series of double syllabled, clear, ringing whistles, followed by a soliloquizing twitter. It is a thrilling burst that is startling and wild. The proper accompaniment is a wild, wooded glen in which a stream tumbles over its rocky bed.

Like the Water-Thrush, this species has two song periods, the first closing late in June or early July, the second beginning early in August. I have heard the passion song in August also.

West to the Plains, north to southern Michigan and southern New England, casually to Lake George.

The passion song of the water thrushes are so much alike that a description of one will serve for all. There is in each

the same ringing ecstacy of joy. The song seems to swing once round a great circle with incredible swiftness but perfect ease, ending in a bubbling *dimiduendo* as the performer lightly touches the perch or ground with half rigid wings held high. The song is a flight song, usually occupying less than half a minute, but packed with the intense life of the bird. I have seen the Oven-bird suddenly vault into the air, mounting to the tree tops on quivering wings, then dart back and forth in a zigzag course swift as an arrow, and finally burst into a song as he floated gently down. There is some difference in the passion songs of the three species, which seems to be in the use of some notes of the ordinary song at the close, rarely at the beginning. Sometimes the Oven-bird closes his passion song with a burst of the perfect call song.

It seems hardly fair to say that the songs of the Water-Thrushes are thrush-like, since there is almost nothing of the true thrush timbre to their songs. On the contrary, a careful analysis discloses, rather, a true Warbler timbre, obscured as it is.

Swainson's Warbler. *Helinaia swainsonii.* 638.

Mr. O. Widmann, who has probably given the breeding song of this Warbler more careful study than any other person, says of it: "It begins like the Water-Thrush and closes like the Louisiana Water-thrush." Mr. Wm. Brewster describes the song as "A series of clear ringing whistles, the first four uttered rather slowly and on the same key, the remaining five or six more rapidly and in a descending scale." He also says that in general effect it resembles the song of Water-Thrush. The Warbler is not a regular singer, according to Mr. Widmann, but seems to wait for an inspiration, and when it comes he must needs deliver his message.

I can find nothing definite concerning the song period, nor as to whether there may be a renewal in the fall.

The haunts of this bird are the vast swamp tracts of the southern states, as far north at least as the southern-most counties of eastern Missouri, where Mr. Widmann found it nesting. It apparently ranges to south-western Indiana and west to Texas.

Mourning Warbler. *Geothlypis philadelphia.* 679.

In quality and style this Warbler's songs bears a strong resemblance to that of Water-Thrush, the variations having the same general quality, but the song is considerably less in volume and lacks the wild thrill of the Water-Thrush. The song which I have heard most frequently is *tee te-o te-o te-o we-se*, the last couplet accented and much higher pitched. A less common form slightly resembles the *creschendo* chant of Oven-bird, but is weaker. It is rather a swell than a *creschendo.* Dr. Merriam describes a variation which I have never heard: *true true true true too*, the last and next to the last syllables with falling inflection and more softly. The song is clear and whistling.

Song is incessant during the northward movement, but there is apparently none on the return journey.

This Warbler frequents low brush thickets in rather damp places, and appears to be solitary in its habits when migrating.

West to the Plains, north into Canada, breeding from the northern states northward.

Olive Warbler. *Dendroica olivacea.* 651.

Very little seems to have been written of the song of this Warbler. From that little one would be led to expect a high pitched, melodious, liquid, whistling song, on a descending scale; the separate notes not unlike the first note in the Whipporwill's lay; possibly resembling the last cadence of Swainson's Warbler.

The Olive Warbler lives in the highlands of Guatemala and Mexico, north into southern New Mexico and to Mt. Graham, Arizona.

The songs of the next three species bear a resemblance to the clear whistles of Carolina Wren; but the resemblance is rather in the quality of the whistle than in the manner of utterance.

Yellow-throated Warbler. *Dendroica dominica.* 663.

This song seems to resemble that of Indigo Bunting as well as Carolina Wren, but it is wilder and more ringing than

the Indigo. Mr. Brewster describes it thus: *twsee-twsee-twsee-see*, the last two rising and terminating abruptly. I find no mention of a song period in fall. The song has a certain ventriloquial quality.

The birds frequent the tops of trees bordering streams, moving about rather leisurely for warblers.

This species is confined to the southern United States, north to southern Maryland and Virginia, rarely to southern New England. The sub-species

Sycamore Warbler. *Dendroica dominica albilora.* 663a.

Is the form which inhabits the Mississippi Valley from western North Carolina to the Plains, north to southern Michigan.

The described songs seem to be practically identical with those of the species. Prof. A. W. Butler gives the fullest description: *twit, che-e, che-e, che-e, che-e, che-a*, the first abrupt with rising inflection, the next four following after a pause, all on the same pitch, the last rising sharply. While the syllables are different the description is almost exactly as above.

As the name indicates, this Warbler is most at home among the upper branches of sycamore trees which fringe the streams. His untiring activity makes study tantalizing.

Kirtland's Warbler. *Dendroica kirtlandi.* 670.

The song of this rare Warbler shows a marked tendency toward the Maryland Yellow-throat type, with a full oriole-like quality, "in marked contrast to the high notes of many warblers." It also resembles the song of the Yellow-throated Warbler. There are no syllable descriptions.

The rarity of this Warbler makes his geographical distribution somewhat uncertain. But he seems to be one of the warblers of the eastern part of North America, west at least into Illinois and Wisconsin, and east to Washington, D. C. He probably breeds north of the United States.

Kentucky Warbler. *Dendroica formosa.* 677.

The song of this species is probably more like the whistle of the Carolina Wren than any other Warbler. Mr. Burns has

studied the song so carefully that he is fully qualified to speak for his locality at least. He has clearly distinguished a type for the earlier migrants and another for such as remain to breed. The migration type is: *peer-ry peer-ry peer-ry peer-ry peer-ry*, often *chee chee chee pere-ey pere-ey pere-ey*. The breeding song is: *too-dle too-dle too-dle too-dle*. The style of delivery is Cardinal-like, but weaker and finer in tone. The song carries far, ringing thru the woods. The bird seems to prefer to sing while perched, and rarely if ever does so while feeding.

One must look for this Warbler in rather densely grown wet or well watered woods, more often on the ground than in the trees. He is one of the Warblers that walk.

Mr. Burns states that the song period ceases about the middle of July (17 in 1899), and no mention is made of renewal of song later.

West to the Plains, north to southern Michigan. Breeds from the Gulf states northward.

This properly closes the group of true whistlers. While the species which follow are transational they are more closely allied to those which precede than to any others. They are strong-voiced birds whose songs possess a carrying power second only to the preceding species, and exceeding some of them. The most familiar one is

Maryland Yellow-throat. *Geothlypis trichas.* 681.

The call song is a repetition of three or four syllabled phrases, one of the syllables strongly accented. Sometimes the accent is on one, sometimes on another syllable. The variation is neither individual nor seasonal, as any one may readily prove by listening to an individual sing for half an hour. The song is well represented by the syllables commonly used to describe it: *wichity, wichity, wichity*, or *wee-che-te*, for the three-syllabled song, and *wee-te-chee-te* or *wee-tee-see-tee*, for the four-syllabled. In every three-syllabled song that I have heard the accent has been on the first syllable. In the four-syllabled it may be on either of the four, at the pleasure of the performer. The accented syllable has the appearance of being longer than the others, and it is often on a higher pitch. Not infrequently the third and fourth syllables

are raised in pitch more or less, in which case the accent is likely to be spread over both, the third taking rather more of it. The song usually increases in volume as it proceeds.

The tone is shrill, but loud and clear, and closely approaches a whistle, but having a suggestion of the Warbler hiss. The bird throws his whole being into the utterance. His perch is usually elevated somewhat above the surrounding brush, while singing, but is seldom on the topmost twig.

This species has a passion flight song which is delivered much after the fashion of the Oven-bird, and is not unlike it in being a medley of its call song notes.

The Maryland Yellow-throat arrives singing with the host of warblers in late April or early May, and sings well toward August. After about a month's rest he resumes the song, but ceases again about mid-September. Rarely one may hear the song all summer long. Mr. Bicknell regards the September singing rare, but my record of four years shows no late August singing, but always early in September full songs.

The specific form is confined to the region east of the Mississippi River and south of Hudson Bay and Labrador. From the Mississippi Valley to the Cascade Mountains it becomes

Western Yellow-throat. *Geothlypis trichas occidentalis.* 681a.

And from Florida to southern Georgia the

Florida Yellow-throat. *Geothlypis trichas ignota.* 681b.

The Pacific coast form is

Pacific Yellow-throat. *Geothlypis tricas arizela.* 681c.

It seems likely that the two south-western forms,

Belding's Yellow-throat. *Geothlypis beldingi.* 682.

which inhabits the southern part of Lower California, and

Rio Grande Yellow-throat. *Geothlypis poliocephala ralphi.* 682.1.

which is found in the lower Rio Grande Valley, are not

greatly unlike our eastern form in song. At any rate this is as good a place for them as could well be found.

Connecticut Warbler. *Geothlypis agilis.* 678.

In this song there is a mixture of Oven-bird and Maryland Yellow-throat, but the resemblance is no doubt closer to the latter. Mr. Thompson's *free-chapple free-chapple free-chapple-whoit* will recall it to some. Mr Butler prefers the word "beecher." Mr. Gault describes six variations which seem well worth repeating here.

1. *Wheat-a; wheat-a; wheat*, gradually increasing in volume to the last.
2. *Wheat, our winter wheat*, or *our winter wheat.*
3. *Chip chee-a-wee; chip chee-a-wee; chip chee-a-wee.*
4. *Wheat, winter wheat, winter wheat, winter wheat.*
5. *Wheat here*, and sometimes only *wheat:* this on bright moon-light nights.
6. *Wheat-it-ta, wheat-it-ta, wheat*, the last syllable sometimes omitted.

No one could doubt the resemblance to Maryland Yellow-throat from these representations.

I find nothing to indicate the duration of the song period, nor whether there is the recurrence of song in fall.

The northern tamarac swamps and bogs are the home of this Warbler. It is one of the "ground warblers," spending much time on the ground.

It is another of the numerous company of warblers of eastern North America, breeding north of the United States. It passes north with the Warbler host in early May.

There are several species whose songs have not been described at all, or inadequately described for the purposes of this paper. They may be given in systematic order.

Lucy's Warbler. *Helminthophila luciæ.* 643.

Arizona and extreme southwestern Utah, from the Santa Clara Valley southward to Sonora; New Mexico.

Virginia's Warbler. *Helminthophila virginiæ.* 644.

"The male is very musical during the nesting season, uttering his *swee* ditty continually as he skips thru the bushes in search of his morning repast; or having satisfied his appetite, he mounts to the top of some tree in the neighborhood of his nest, and repeats at regular intervals a song of remarkable fullness for a bird of such minute proportions."—Mr. Aikin, in Nehrling's Our Native Birds of Song and Beauty, Vol. I, p. 189.

Rocky Mountain region of the United States, from Wyoming, Colorado, Utah, and Nevada southward on the tableland of Mexico and Guanajuato.

Grace's Warbler. *Dendroica graciæ.* 664.

"This beautiful Warbler is pre-eminently a bird of the pines. It is found as soon as the pine belt is entered, and continues almost to its upper limit; but I did not meet with any in the aspens, firs, or spruces above the pines. Its song is a sweet warble, frequently uttered from the lower boughs."—Dr. E. A. Mearns in The Auk, Vol. 7, p. 261.

Southern New Mexico and Arizona, and south into Sonora.

Black-throated Gray Warbler. *Dendroica nigrescens.* 665.

The only description that I have been able to find is that by Nuttall, "*t-shee-tshay-tshaitshee*, plaintive." It would be difficult to assign its position from so meagre a description.

Western United States, north to Colorado, Oregon and British Columbia west of the Cascades.

Painted Redstart. *Setophaga picta.* 688.

Mountains of Mexico, north to southern Arizona.

Red-bellied Redstart. *Setophaga miniata.* [689.]

Highlands of Mexico. Texas (Giraud).

Red-faced Warbler. *Cardinella rubrifons.* 690.

Southern Arizona and southwestern New Mexico, thru Mexico to Guatemala.

Red Warbler. *Erigaticus ruber.* [691.]

Highlands of Mexico. Texas (Giraud).

Brasher's Warbler. *Basileuterus culicivorus.* [692.]

Central America, from Panama north to Eastern Mexico. Texas (Giraud).

Bell's Warbler. *Basileuterus belli.* [693.]

Guatemala and Mexico, north to the temperate regions of Vera Cruz. Texas (Giraud).

CONCLUSION.

It is painfully apparent, from the foregoing discussion, that the subject is far from exhausted. We have hardly more than scraped the rind of it yet. We need first of all to learn the songs of the remaining species and sub-species. We need to devise some more perfect method of representing the songs which will admit of more fruitful comparisons than those now in use make possible. We need to follow the whole course of the migrating birds in order to learn what the variations are, where there are any, in the course of the journey northward; and if the breeding song differs from the migrating songs, what the difference is and why. We know so little about the second, or autumn, song period, that it is necessary to study it from the beginning with most species. We know that the females of some species sing, but under what circumstances and what part of the whole song of the species is not known. These are questions which can be answered by careful study.

There are other problems which belong more particularly to the wider subject of bird song, but which a study of Warbler songs will greatly help to solve. How far the sub-species

have departed from the song-type of the species; whether there is a recognizable longitudinal variation in keeping with color variation, as the process of differentiation grows toward the formation of sub-species from merely geographical races; what the difference is between young and old, bright plumaged and dull plumaged birds within the species; what is the effect of environment upon the same individual to determine its effect upon the species; how far imitation determines the quality of the song of the individual. And so we might go on suggesting topics for study to the end of the page. We need only to perceive that the subject is inexhaustable, and a fruitful one for investigation.

A FIELD KEY TO THE SPRING MALES.

I. Throat red, orange or chestnut.
II. Throat black or dark slate-color.
III. Throat yellow, white or whitish ; under-parts without streaks or spots.
IV. Throat white or whitish ; under-parts streaked or spotted.
V. Throat yellow ; under-parts streaked or spotted.

I. Throat Red, Orange or Chestnut.

1. Throat chestnut.
   a. Top of head chestnut ; sides of head black. Bay-breasted Warbler.
   b. Whole head rich chestnut. (Extreme south-west). Mangrove Warbler.
2. Whole throat, chest and head orange-rufous. (Extreme south-west). Olive Warbler.
3. Throat orange or flame-color ; crown yellow. Blackburnian Warbler.
4. Throat red.
   a. Crown and ear-coverts black. (Extreme south-west). Red-faced Warbler.
   b. Ear-coverts silvery-white. (Extreme south-west). Red Warbler.

II. Throat Black or Dark Slate-Color.

A. Belly white.
   1. Back blue-gray; side of head black and white. (Western). Black-throated Gray Warbler.
   2. Back deep blue ; a white spot in wing. Black-throated Blue Warbler.
   3. Back black ; a white spot in wing. (Alleghanies). Cairns' Warbler.
   4. Back black ; sides of head yellow and black. Golden-cheeked Warbler.
   5. Back gray and black ; top and sides of head yellow. (Western). Hermit Warbler.
   6. Back green ; cheeks and forehead yellow. Black-throated Green Warbler.
   7. Back olive-green ; line over eye and breast yellow. (Western). Townsend's Warbler.
   8. Back grayish ; a large yellow patch in wing. Golden-winged Warbler.
   9. Back black ; patches of flame-color in wing, on sides of breast and in middle of tail. Redstart.

B. Belly yellow.
  1. Throat slate-color.
    a. No white eye-ring; breast with traces of black. Mourning Warbler.
    b. A white eye-ring; breast with no traces of black. Connecticut Warbler.
    c. A white spot on eyelid; sides of head black. (Western). Macgillivray's Warbler.
  2. Throat black.
    a. Forehead and cheeks yellow, rest of head black. Hooded Warbler.
    b. Forehead yellow; crown with a black patch. Bachman's Warbler.

C. Belly red.
  1. A large white patch on wing; no chestnut on head. (South-west). Painted Redstart.
  2. No white wing patch; chestnut patch on crown. (South-west). Red-bellied Redstart.

III. Throat Yellow, White or Whitish; Under-parts Without Streaks.

A. Large as a Catbird.
  1. Back olive-green; throat and breast rich yellow. Yellow-breasted Chat.
  2. Back olive-gray. (Western). Long-tailed Chat.

B. Much smaller.
  1. Throat yellow.
    a. Whole head, neck and breast bright yellow. Protonotary Warbler.
    b. Forehead and cheeks black; line over yellow eye. Kentucky Warbler.
    c. A broad, rounded black patch on cheeks. Maryland Yellow-throat.

(NOTE.—An artificial key to the Yellow-throats would be of such doubtful value a-field that the reader is referred to the habitat of the different forms in the body of the paper).

    d. Head and back olive-green; two white wing-bars. Pine Warbler.
    e. Crown bluish ash or gray.
      1. Upper tail-coverts yellowish olive-green.
        (a). Lower parts yellow.
          (1). Yellow intense. (Western). Calaveras Warbler.
          (2). Yellow less intense. Nashville Warbler.
        (b). Lower parts white or whitish. (Western). Virginia's Warbler.
      2. Upper tail-coverts chestnut. (Western). Lucy's Warbler.

f. Forehead yellow; a black line in front of eye.
Blue-winged Warbler.

g. Forehead yellow; crown black.
1. Duller colored. Wilson's Warbler.
2. Brighter colored. (Western). Pileolated Warbler.

h. Head bluish; breast with a chestnut patch.
1. Underparts yellower; less black on side of head.
Parula Warbler.
2. Underparts duller; side of head blacker.
Northern Parula Warbler.
3. Same as 1 and 2. (Extreme south-west). Sennett's Warbler.

i. Head ash-gray; line over eye yellow. (South-west).
Grace's Warbler.

j. Top of head with black stripes.
1. Lores chestnut. (South-west). Brasher's Warbler.
2. Lores black. (South-west). Bell's Warbler.

III. Throat white or whitish.
a. Crown with two blackish stripes. Worm-eating Warbler.
b. Crown plain brown. Swainson's Warbler.
c. Crown bluish-ash; back olive green. Tennessee Warbler.
d. Crown with a partially concealed patch of rufous brown; back dull olive-green; underparts pale yellow.
Orange-crowned Warbler.
ee. Above bright olive-green; brighter underneath. (Western). Lutescent Warbler.
Another western form, not very different, is Dusky Warbler.

IV. Throat White or Whitish; Under-parts Streaked or Spotted.

A. A patch of yellow on the side of the breast.
1. Crown and rump with a yellow spot. Myrtle Warbler.
There is no field character to distinguish the western form. The wing and tail are longer. Hoover's Warbler.
2. Yellow band on middle of wing and tail. Immature of Redstart.

B. No yellow patch on side of breast.
1. With conspicuous wing bars.
a. Back bright bluish. Cerulean Warbler.
b. Back grayish; crown black. Black-poll Warbler.
c. Back greenish yellow; sides chestnut. Chestnut-sided Warbler.
2. Without wing-bars. Walking Warblers.
a. Middle of crown with a rufous streak. Oven-bird.
b. Crown plain; line over eye buff. Water-Thrush.
The form from Illinois westward is larger.
Grinnell's Water-Thrush.
c. Crown plain; line over white eye. Louisiana Water-Thrush.
3. Everywhere streaked black and white. Black and White Warbler.

V. Throat Yellow, Under-parts Streaked or Spotted.

A. Belly white.

1. Line over eye yellow in front of eye. Yellow-throated Warbler.
2. Line over eye entirely white. Sycamore Warbler.

B. Belly yellow.

1. Streaks on the underparts rufous brown.
   a. Crown yellow, back greenish. Yellow Warbler.

(NOTE.—The south-western form, with back yellower and streaks underneath almost obsolete, is Sonora Warbler.

The darker form inhabiting Alaska to British Columbia, is Alaskan Yellow Warbler).

   b. Crown Chestnut, back brownish.
      (1). Undeparts soiled yellowish-white. Palm Warbler.
      (2). Underparts entirely bright yellow. Yellow Palm Warbler.
2. Streaks or spots on the underparts black.
   a. A yellow spot on crown and rump. (Western). Audubon's Warbler.
   b. Back grayish, unstreaked; a necklace of black spots on the breast. Canadian Warbler.
   c. Back greenish, streaked with black; crown bluish. Kirtland's Warbler.
   d. Back greenish, streaked with black; ear-coverts rufous. Cape May Warbler.
   e. Back greenish, with a patch of rufous brown. Prairie Warbler.
   f. Back black; crown grayish; tail black with a white band across the middle. Magnolia Warbler.

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Notes on Rhode Island Ornithology

A quarterly publication for the purpose of furthering interest in ornithology in this State.

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Old Series, Vol. XII. New Series, Vol. VII, No. 2.

THE WILSON BULLETIN.

No. 31.

AUG 13 1986

Issued Quarterly by the Wilson Ornithological Chapter of the Agassiz Association.

A MONOGRAPH OF THE FLICKER.

(*COLAPTES AURATUS.*)

BY FRANK L. BURNS.

Price 50 cents.

Oberlin, Ohio, April, 1900.

Entered at the post-office at Oberlin, Ohio, as second-class mail matter.

COPY

An unabridged and unaltered reproduction
of the original issue.

THE WILSON ORNITHOLOGICAL SOCIETY

January 1980

INTRODUCTION.

WHILE the immense strides taken by American ornithology during the past score of years has seriously taxed the energies of the amateur to keep within hailing distance, and despite the volume of notes annually published in the various periodicals and books, the demand for complete life histories of even our most familiar birds have not lessened to any great extent. The life of one person would prove far too short to attempt a thorough study of a single species in all its characteristics; hence the absolute necessity for the co-operative work advocated and practiced by the Wilson Ornithological Chapter to obtain results at all satisfactory.

In spite of the devotion of the leisure moments of five years and the generous aid of a large corps of enthusiasts, the frank acknowledgment that the succeeding pages do faint justice to the subject of this paper, is not a matter of discouragement. Nature's Book will always contain fresh and delightful pages for the curious and observant.

Few have any idea of the magnitude of the literature under the title of a single name, and the unavailability of much of it for a work of this kind, because of its fragmentary or negative nature. A realization of the latter has caused the writer to go to the other extreme in frequent cases, with the hope that the mass of detailed information, while it may detract from the general appearance of the paper, will prove useful timber for a more competent builder, or of value for reference.

As far as it was practicable to do so, the compiler has conscientiously striven to place the credit of observations where it belongs, and the quotation marks are used when the exact language is extracted from publications.

All notes have been taken under the name that has held good for almost a century and a half. This, combined with the impossibility of the average student positively identifying any but the extreme types of the subdivided species, has necessi-

tated the present title. Since the difference which exists is purely geographical, the detraction from the value of the paper on this account can scarcely be more than fictitious.

The enumeration of the localities from which notes were taken, together with those represented in the publications examined, is dispensed with for the simple reason that the list would occupy too much space. It is sufficient to state that no considerable section of the habitat of the Flicker is unrepresented.

I am greatly indebted to the following gentlemen for valuable information, ranging from a local name to extended notes: Stephen J. Adams, Jos. H. Armfield, Paul Bartsch, James Newton Baskett, Jacob Bastion, Jr., Frank A. Bates, A. C. Bent, Allen Brice Blakemore, Lionel F. Bowers, J. H. Bowles, Clement S. Brimley, Verdi Burtsch, Virginius H. Chase, J. N. Clark, W. W. Colburn, Willard N. Clute, Fred A. Colby, Francis R. Cope, Jr., Rev. W. L. Dawson, E. A. Everett, W. A. Foxhall, Prof. Angus Gaines, Albert O. Garrett, Benj. T. Gault, Otto Grady, Russell Gray, John H. Flanagan, Esq., Fred Hamlin, Henry C. Higgins, Ned Hollister, Walter Hoxie, Ernest Ingersoll, J. Warren Jacobs, Prof. Lynds Jones, Prof. Ora W. Knight, Gustavus Kohn, Frank H. Lattin, J. Eugene Law, Dr. Walter W. Maires, Dr. Willard L. Maris, C. C. McGinty, E. A. McIlhenny, C. D. McLouth, H. Harvey McNairn, J. C. Mead, John C. Meisky, Harry Edward Miller, H. P. Mitchell, Walton I. Mitchell, C. H. Morrell, Arthur H. Norton, W. A. Oldfield, Rev. William Osburn, Rev. P. B. Peabody, A. L. Pearse, Amos Peifer, Chief Simon Pokagon, W. C. Purdin, James B. Purdy, Calvin L. Rawson, Fritz R. Raymond, Dr. Willet E. Rotzell, James Savage, W. G. Savage, R. P. Sharples, Burk H. Sinclair, Robert Windsor Smith, D. D. Stone, Reuben M. Strong, J. W. Suliot, Arthur T. Wayne, Julius Wendler. To Prof. Jones, Messrs. Jacobs, Smith, Strong, Gault, Baskett, Hollister and Law, especially, I wish to express my appreciation for valuable material and assistance.

FRANK L. BURNS.

Berwyn, Pa., March 1, 1900.

SYNONYMS.

SCIENTIFIC. Polynomials. *Picus varius major alis aureis*, Catesby, "Natural History of Carolina, Florida and the Bahama Islands," Vol. I, plate 18, full size colored figure, 1731.

Cuculus alis deauratis, Klein, "Historiae Avium Prodromus, cum Praefatione Ordine Anamalium," etc., 1750, page 30.

Binomials. *Cuculus auratus*, Linnæus, "Systema Naturæ," 1758, 10th Edition, Vol. I, p. 112.

Picus auratus, Linnæus, "Systema Naturæ," 1766, 12th Edition, Vol. I, p. 174.

Colaptes auratus, Swainson, "Zoological Journal," 1827, Vol. III, p. 353.

Colaptes auratus luteus, Part, Bangs, "Auk," 1898, Vol. XV, p. 117.

Modern nomenclature dates from 1758, when Linnæus introduced what is known as the binomial system, consisting of a generic, followed by a specific term; hence Catesby's many-worded descriptive name, though the earliest, receives no recognition. The same may be said of Klein who, almost a score of years later, erroneously placed it with the Cuckoos. Linnæus followed his predecessors closely, considering the difference in systems, and to him is given the credit of the specific term; while to Swainson, erecting a new genus almost a century after Catesby, is given that of the generic term.

According to Coues, *Colaptes* is of Greek derivation, signifying "a chisel, hammer," and *auratus*, "gilden, golden (colored"). More appropriate terms could scarcely have been chosen. Bangs' third term, reducing the northern bird to sub-specific rank, follows to complete the synonymy, illustrating the instability of American nomenclature and the difficulties placed in the way of a study of the literature of a species.

Though the American Ornithologists' Union does not recognize hybrid forms as even sub-species, some of our lead-

ing authorities have at one time or another suggested designations for this peculiar form. Accordingly, as in the case of *C. a. luteus*, I have added such names in the sense of being pure synonyms, which apply equally to *C. cafer*.

Picus ayresii, Part, Audubon, "Birds of North America," 1843, Vol. VII, p. 348.

Colaptes hybridus, Part, Baird, "Pacific Railroad Exploration and Survey Report," 1858, Vol. IX, p. 123.

Picus hybridus, aurato-mexicanus, Part, Sundevall, "Conspectus Avium Picinarum," 1866, p. 72.

Colaptes auratus + *Colaptes cafer*, Coues, "Key to North American Birds," 1872, 1st Edition, p. 198.

Colaptes auratus hybridus, Part, Ridgway, "Nomenclature of North American Birds," 1881, p. 35.

Audubon's type, now deposited in the Philadelphia Academy of Natural Sciences, is a male in breeding plumage, exhibiting the yellow shafts of *auratus* and the red malar stripes of *cafer*, and in the absence of intermediate specimens was thought to have been a good species. Baird found it in all stages of blending in Nebraska, Wyoming, Montana and the Dakotas — principally in the Upper Missouri and Yellowstone river regions — and recognized its true relationship. It is said that at about this time Cassin was inclined to believe that it could be broken up into several distinct species; a belief which he did not act upon, however. Sundevall and Coues adopt forms which are comprehensive, while at the same time somewhat unique. Ridgway admits it as a sub-species. I am informed that in the next edition of Coues' "Key to North American Birds," it was the intention to have it appear as *Colaptes auratus ayresii*, going back to Audubon for the subspecific term, which Hargitt has already made use of in the British Museum Catalogue, omitting the middle term.

VERNACULAR. Happily our subject escaped the servitude of the prefixed personal name, laid on so many of its class, which in common with names of an indifferent, irrelevant or misleading nature, are the chief obstacles to the acceptance and common use of the official vernacular titles. Names descriptive of form, flight, plumage, notes, habits, habitat, characteristics, etc., or of onomatopoetic origin, are preferable if short and catchy. With its matchless array of marked charac-

teristics, any one of which would well deserve the adoption of a concise descriptive name in a species less excentric, no word in the English language would prove more apt than the one it now possesses—the name given it by the early settlers.

While the compilation of a dictionary of synonyms was not originally contemplated, the vulgar appellations or aliases collected from various sources number 124, all of which have been actually in use, either generally or locally. The probable derivation and meaning, as well as other notes, have been added, when it appeared necessary. Although apparently so varied in character, there is scarcely a name that cannot be placed in one of the three divisions: Descriptive, Onomatopoetic, Misnomers.

Antbird. Minnesota. So called from its well known taste for ants (*Hymenoptera*), of which it devours immense quantities.

Big Sapsucker. Northern States. Misnomer.

Carpintero. Spanish. Obsolete in the United States. Carpenter—the name given to the whole Woodpecker family in Spanish America.

Cave-duc. Maine. Of French Canadian origin. Apparently confounded with the hole-nesting species of horned or eared Owls and continued through ignorance of the original. Along the St. Lawrence river the natives call the horn-owl "cave-duc" or "horn-coot"—Russell Gray.

Clape, Claype. Western New York, Western end of Long Island. Ernest Ingersoll quotes Dr. DeKay as follows: "Said to have been some provincial word introduced by the early English colonists." In this instance it is doubtless misapplied, as our New York observers unite in the assertion that it is an imitation of the loud spring call note.

Common Flicker. Sometimes used in the East, but more frequently in some sections of the West, where both *auratus* and *cafer* occur.

Cotton-rump. Pennsylvania. From the conspicuous white patch of feathers on the rump. (A similar name—Cotton-tail—has been applied to *C. cafer* in California according to H. R. Taylor).

Crescent-bird. West. From the prominent black crescent on the breast, or the scarlet occipital crescent, or both.

Eastern Flicker. West. Its habitat from a western standpoint.

English Woodpecker. Long Island; Newfoundland. Probably traceable to the early settlers, who doubtless considered it nothing more nor less than a "degenerate offshoot" of a species inhabiting that country.

Fiddler. Cape Cod, Massachusetts. I feel pretty sure that this name is derived from the peculiar sew-saw motions indulged in by the males while courting the females during the early spring months.—Willard N. Clute.

Flicker. This is the most popular and generally used name. Some difference of opinion exists as to the exact derivation of the term, some contending that it is from the song—*wicher* and variations—hence onomatopoetic; while others are just as sure that it must have been suggested by the peculiar twinkling or flickering of the bright shafts when the wings open and close in flight. The latter would commonly suggest the name before the bird had uttered a sound.

Flicker Woodpecker. Middle States.

Flitter. Eastern Pennsylvania. A corruption of Flicker.

French Woodpecker. New Hampshire. Probably derived from the mongrel term, French-pie, which is one of the local names in common use in some parts of England for the Great Spotted Woodpecker (*Picus major.*)

Gaffle Woodpecker. Hudson, Massachusetts. Perhaps a provincial corruption for "gaffer"—a talkative old man.—Frank A. Bates. Or a corruption of "Yaffle," for which see same.

Galliz. Northern New Jersey. Pretty generally so called by the bird-nesting boys.—Willard N. Clute. Evidently an abbreviation of the old English title, "Galley-bird," which, according to Charles Swainson in "Provincial Names of British Birds," is the Sussex name for a woodpecker. The old time supposition was that all of this tribe were doomed to "incessant toil and slavery:" hence the term.

Gel Specht, Gelb Specht. Pennsylvania. German or "Pennsylvania Dutch." Pronounced gail spycht. Yellow Woodpecker.

Golden Sapsucker. Southern New Jersey. Common name in that region.—Dr. Walter W. Maires.

Golden-shafted Flicker, Golden-shafted Woodpecker, Golden-wing, Golden-winged Flicker, Golden-winged Woodpecker, Gold-wing Woodpecker, Golden-wing Woodpecker, Gold-winged Woodpecker. In more or less frequent use, chiefly through the influence of our earlier ornithological writers.

Golden Woodpecker. New York.

Golden-winged Woodcock. Iowa. Misnomer.

Grasshopper Woodpecker. Vermont. From its habit of frequenting open fields where grasshoppers (*Acrididæ*), abound upon which it feeds.

Hairy-wicket, Harry-wicket. New England. Corruption of the love or scythe-whetting notes.

Hammer-Head. Western part of Hampshire county, Massachusetts. This name is equally applicable to any other woodpecker.—W. W. Colburn. A homonym. "Name given in the Cape Colony, Africa, to *Scopus umbretta*, which is allied to the Herons."—Newton's Dictionary of Birds.

Hick-wall. Connecticut. Obsolescent. A relic of the old world, of which Hewel and Hew-hole are said to be corruptions. The older form of which, "Hick-waw" (Holly hand) and Hickway and Highawe (Cotgrave) can hardly have come from anything but the Anglo-Saxon "Higera" or "Higere" (T. Wright), meaning laughter, and doubtless referring to the cry of the Green Woodpecker (*Gecinus viridis*).—Newton's Dictionary of Birds.

High-hole, High-holer, High-hold, High-holder. Northern United States and Canada. "From the usual position of its nest."—Earnest Ingersoll. Further modifications of "Hewel," "Hewhole," "Heigh-hawe," or "High-hawe."—Newton's Dictionary. The terms may have originated in accordance with Newton's statement, but are now used only in the sense defined by Ingersoll.

High-ho Woodpecker. Wisconsin. A contraction of High-hole.

Hittock, Hittocks, Hittuck. Canada. New Jersey. "Said to have been handed down from the Delaware Indians, being the Leni-Lenape word for tree."—Heckwelder. "Probably originated from a fancied resemblance of its notes to the sound of the words."—Alexander Wilson. "So called by the Swedes on account of its notes."—Kalm.

Hivel. New York; Ohio. Origin in doubt. Possibly a corruption of the old English word Hewel, for which see High-hole and Hick-wall; or a contraction of hive-hole, from the buzzing bee-like sounds emitted by the small young in the nest.

Hybrid Flicker. Name given the mixed birds of the West by Baird.

Jaune, Joune. Louisiana. French. Meaning yellow. The second a corruption of the first.

Le pic aux ailes dorees. Name given by Buffon. French, Golden-winged Woodpecker.

Little Woodchuck. Caloosahatche River Region, Florida. The adjective is used to distinguish the smaller from the "Big Woodchuck" (Ivory-billed Woodpecker).—D. D. Stone.

Meadow Partridge. Wisconsin. Misnomer. From its hurried, Partridge-like manner of flushing from the grass-fields when startled.

Missouri Red-moustached Woodpecker. Audubon's name for the hybrid (*C. ayresii*).

Mo-ning-qua-na. White Earth Reservation. Chippewa Indians. "Bird with dirty-colored wings."—W. W. Cooke.

Northern Flicker. Prefix given by Outram Bangs to that portion breeding from North Carolina northward.

Ome-tuc. Maine. Probably of Indian and onomatopoetic origin.

On-thee-quan-nor-ow. Hudson Bay Region. British America. Natives. "From the golden color of its shafts and lower sides of wings."– Alexander Wilson.

O-zaw-wan-day Paw-Paw-say. Lower peninsula of Michigan. Pottawatomie Indians. Yellow or Golden-colored Woodpecker.

Partridge Woodpecker. Wisconsin; Massachusetts. See Meadow Partridge.

Paw-Paw-say, plural **Paw-Paw-say-og.** Lower peninsula of Michigan. Pottawattomie Indians. "Paw-big (flea) hence the word, jumping about quickly in any direction. Our people did not go into varieties nor define birds and mammals as Europeans do. For instance: should we want to describe more particularly the Red-headed Woodpecker, we would say Mis-qud (red)-o-dib (head), Paw-Paw-say (Woodpecker); or

O - zaw - wan - day Paw - Paw - say, (Yellow or Golden - colored Woodpecker).—Simon, Chief of Pokagons.

Peckwood, Peckerwood. Florida, Georgia, Michigan. Transposition of Woodpeck and Woodpecker.

Peerit, Pee-ut. New England. **Pe-up.** Massachusetts. From its shrill call notes.

Pie-bis, Pie-bris. Louisiana. French. Brown Pie or Magpie. A Misnomer.

Pigeon Woodpecker. New England; New York; Minnesota. "Arising from the peculiar pigeon-like attitude when perched across the branch instead of lengthwise along it as do other more genuine woodpeckers."—Ernest Ingersoll.

Pink-throat. Mackinac Island, Michigan. In certain lights the pinkish-cinnemon of the neck appears to advantage.

Picque-bois-jaune. Louisiana. French. Yellow Woodpecker.

Piut, Pi-ute. New England. Same as *Peerit.*

Sapsuck, Sapsucker. Southern States. From the belief that it extracts sap from the trees in which it bores. Misnomer.

Shad-spirit. New England Coast. "A half superstitious idea of the fishermen of former days—and it may be yet—that this bird came up from the south and ascended the rivers just ahead of vernal migration of shad, in order to inform them of the approach of the fish; in other words, a noting of a coincidence."—Ernest Ingersoll. Its spring cry is heard at about the time the first shad are caught in the Merrimac river.—Walter Hoxie. A parallel case in the Old World is that of *Mackerel-bird*, on Guernsey Island, for the Wry-neck, referring to its appearance coincident to that of the Mackerel.

Sharp-billed Flicker. Eastern Pennsylvania.

Silver Dollar Bird. Pennsylvania. "From its white rump mark which it shows so conspicuously when rising from the ground."—W. W. Colburn. According to Gould "Handbook of the Birds of Australia," the Australian name for *Eurystomus pacificus* is Dollar Bird, from the silvery - white spot in the middle of the wing, which is distinctly shown when in flight.

Spotted Woodpecker. Name given by Maynard to the whole genus.

Sucker. Florida. See *Sapsucker.*

Specht, Speckt, Speight, Spright. Pennsylvania. German. (Woodpecker). A corruption—*Woodspite*—is locally in use in England to designate the Green Woodpecker, according to Rev. J. G. Wood.—"Popular Natural History."

Talpa-na-ni. Southern Florida. Seminole Indians. It has no equivalent in English. The first part seems to be a generic prefix, and the last two syllables are an imitation of a cry of the kind.—Walter Hoxie.

Taping-bird. Massachusetts. This epithet was applied because it flies as if "measured off tape." In the "Audubon Magazine" an error was made in copying from the "Forest and Stream," making it "Tapping-bird," which would of course make it have a very different meaning.—W. W. Colburn.

Tree-pecker. Lower Delaware Valley. (Obsolete). So called by the early Swedish settlers, according to Heckwelder.

Wa-cup. New London and Windham counties, Connecticut. "So called by every one save a few closet bird men."—C. L. Rawson. Imitation of its song or greeting notes.

Wah-cup. Massachusetts; Long Island. Same as *Wa-cup.*

Wake-up. New England; New York; Minnesota. Corruption of *Wa-cup.*

Wa-wup. New York; Pennsylvania. Same as *Wa-cup.*

Weather-hen. Vermont. Doubtless so called because it becomes, in common with many other species of birds, particularly vociferous just before or after a storm.

Wheeler. Somerset county, Maryland. Probably of onomatopoetic origin.

Wild Hen. Maine. "Its practice of laying additional eggs when the first set is removed gives the bird this name."—Ernest Ingersoll. Its cackling notes are somewhat similar to the common domestic fowl's.

Will Crisson. Dismal Swamp Region, North Carolina. Given me by a gentleman who visited and hunted in that section and heard it applied. I know nothing of its origin or meaning.—W. W. Colburn. Probably another sound-word, corrupted until all trace of the cry represented has been lost.

Woodchuck. Berkshire Hills, Massachusetts; Kansas; North Carolina; Florida. Possibly the suffix is derived from

ck, the original name for hog; hence literally *Woodhog*, from habit of burrowing in the wood in comparison to the root- of the hog in the earth; or *chuck*, used in the sense "to ike," would still be consistent; and again, the latter word ith other meanings. "To call as a hen to her chickens, to er or laugh," would seem equally relevant and appropriate.

Woodcock. New England; Pennsylvania; Iowa. A homo- ymn rather than a misnomer.

Wood-lark. Locality unknown. Misnomer.

Woodpeck, Woodpecker, Woodpicker. Illinois; North Car- lina, Michigan.

Woodpecker Lark. Georgia; South Carolina. "From the black crescent of the breast."—Ernest Ingersoll. Owing to a resemblance in upper plumage as well as the-at-times-similarity of feeding habits and association while on the ground with the Meadow-lark.

Wood Pigeon. New England. Misnomer.

Wood-quoi. Connecticut. A mongrel term, possibly from *Wood-pie*, for which see *French Woodpecker*.

Wood-wall. New England. Clearly an early importation from England, originating from its nesting habits. Said to have been the ancient name for the Green Woodpecker, and occurring in the writings of the old English poets. Still in use in some parts, particularly in the New Forest, Hampshire, according to Cassell.

Xebec. (Pronounced ze-bec). New Hampshire. This is the name under which I received a set of Flicker's eggs some fifteen years ago. The collector knew the species by no other name.—F. H. Lattin. The original of the name is a small sea-going vessel carrying much canvas; hence the nick-name was doubtless suggested by the most conspicuous identity mark of the kind at a distance—the white rump.

Yacker, Yecker, Yucker. New York; Massachusetts. Doubtless of onomatopoetic origin.

Yaffle. Connecticut. Another importation. "The people of Surry and Sussex, England, call the Green Woodpecker 'yaffle' or 'yaffel,' from its repeated notes which are compared to the sound of a laugh."—Cassell.

Yarup, Yar-rup, Yaw-up. Middle States. From its ordinary call note.

Yellow Flicker. West. To distinguish it from the Red-shafted Flicker, whose range it overlaps.

Yellowhammer, Yellerhammer, Yallerhammer, Yellow-'ammer. In general use, ranking next to the Flicker in popularity, more frequently heard in the older States, but not uncommon in the Mississippi Valley, and even cropping out in the far West, thus indicating *C. cafer.* "Yellowhammer is an old Teutonic word, common in Great Britain as the provincial name of the Yellow Bunting (*Emberiza citrinella*). Hammer or 'ammer—it ought to be the latter—means, radically, the chirper, *i. e.*, a small chirping bird, so that Yellow-'ammer=Yellow Songbird. Its application to our Flicker is the result of ignorance long ago."—Ernest Ingersoll. Doubtless the very first settlers, eager to discover something in the wilderness that would remind them of the land they had left, so named the strange bird upon the first flash of yellow, irrespective of the difference in size, structure and habits; and the title continued through a sense of its accidental fitness.

Yellow Jay. New Hampshire, Wisconsin. A misnomer, but not altogether inappropriate, as it possesses a call note almost in common with one of the Blue Jay's.

Yellow-shafted Flicker, Yellow-winged Woodpecker. See Golden-shafted Flicker.

Yellow Wing. Cape Ann, Massachusetts.

Yellow-winged Sapsucker. Pennsylvania. Misnomer.

Yellow-winged Woodcock. Iowa. Misnomer.

Zebec. (*Young Oologist*, '84, p. 22). See Xebec.

GEOGRAPHICAL DISTRIBUTION.

Geographical Range. "Eastern North America; from lorida and the Gulf coast north through the maritime provnces of Canada to Newfoundland and southern Labrador, and he shores of Hudson Bay to about latitude 58°; thence in a orthwesterly direction to Alaska, to about latitude 68°; west hrough about the eastern half of Texas, the greater part of ndian Territory, Kansas, eastern half of Nebraska, South and North Dakota, and the province of Assiniboia and Saskatchewan, Dominion of Canada, to northern British Columbia; accidental in Greenland and Europe."—Bendire's Life Histories of North American Birds. Ranging from the sub-tropical climate of southern Florida and the Gulf coast to the tree limits of the boreal zone, it would appear not only pushing out further to the west into the territory of *cafer*, but a foothold which promises to become permanent has been gained in California. While frequently mixed birds, a number of apparently pure *auratus* have been found; the first record being from San Bernardo, taken early in January, 1885."—Auk, Vol. II, p. 383. Mr. R. P. Sharples, during several years' residence in Oakland, Alameda county, has found it and believes it to breed here. He also examined one skin in a small collection in Marin county, and its owner informed him that he had taken t nearby. This is the most direct route for migrants going to or from the northwestern breeding grounds, yet a little over a quarter of a century ago birds exhibiting even traces of the Yellow-shafted were practically unknown in all that region. There is one record for Colorado. A straggler taken in England in the autumn of 1836 is the only record I have been able to find, though doubtless it has been taken on the Continent also, and a few may and probably do wander into northeastern Siberia.

Winter Range. "It is much more abundant in Winter than in Summer south of latitude 36°, usually inhabiting the

woods and swamps, where it is reported as very wild, keeping well out of the reach of the gun. While it is said to be usually a resident as far north as the 38° parallel, further north it becomes less common, and above the 40° parallel is rather scarce as a resident, although a few are reported at almost every station on the Atlantic slope. "At Cape Cod it is very mischievous during this season, boring holes through the weather boarding of vacant summer residences for no apparent reason except for shelter. Drumming on tin roofs also seems to afford it pleasure."—J. H. Bowles. "At Taunton, Mass., the few that remain find shelter in the deep evergreen swamps or in old ice houses, in which it excavates its winter quarters."—A. C. Bent. "West of the Alleghenies it is found in small flocks on Big Island, Burlington county, Iowa; and is not uncommon at Oberlin, Ohio, Port Sanilac and Plymouth, Mich.; and at Mexico, Mo., extending well out on the prairies, seemingly loss migratory yearly, as it was found throughout the cold winter of '93-'94. "At Wady Petra, Ill., for three winters—'93 to '96—an old male was present almost every day, though during the coldest weather he disappeared for as long as a week at a time; during the morning he usually sat on the east side of the roof of the house."—Virginius H. Chase. "At Oberlin College for two winters—'95 to '97—a solitary bird roosted between the vertical water pipe and wall of Spear Library, and during the winter of '97–'98 one bird made its headquarters in the cupola of the Theological Seminary building."—Lynds Jones. Two records are given for Perry, Iowa—Nov. 18, '93, and Dec. 22, '94. Regardless of the Winter weather from one to three have been noticed every few days throughout December, '99, and January, '00, at Hillsboro, Iowa, which is within ten miles of the Missouri border; and at Waseca, Minn., one was seen on Dec. 11 and 12, '86. At Plymouth, Mich., the cold winters and the scarcity or abundance of beech nuts does not seem to effect the rarity or abundance of the Flicker as it does the Red-headed Woodpecker. It does not winter at Glen Ellyn, Ill.; Iowa City, Iowa, or at any station in Wisconsin or Minnesota. While stragglers have wintered even north of the United States in mild seasons, I believe nearly if not quite all birds found above latitude 40° to be Winter visitants from further north,

mainly hardy old males. In this locality it has decreased as a Winter resident during the last fifty years from common to casual.

Breeding Range. Nesting from Newfoundland to the Dakotas and from the Florida peninsula to Alaska, its range is more extensive than that of any other American Woodpecker. It is said to be nearly co-extensive with its geographical range, being found generally below altitudes of 4000 feet. It is in greater abundance and more generally distributed between the 36° and 46° parallels than anywhere else, and in actual numbers probably falls but little short of equalling all other members of the family combined in the same area. It has been found breeding at Fort Churchill, the most northerly outpost of civilized man's residence on the west coast of Hudson Bay. Unfortunately but little data is available from the great northwest, which is doubtless in part owing to its greater abundance in the States. "At St. Vincent, Minn., it is at no time abundant, nor is there an appreciable increase during the autumnal migrations."---Rev. P. B. Peabody. G. G. Cantwell found it breeding in numbers along the Sixty Mile river, N. W. S., on July 8, '97.—Osprey, Vol. II, p. 25. The table given below is compiled from a large amount of published and unpublished data, showing the average period of Summer residence in various sections of the country. It is believed to be approximately correct. The average date of the arrival of the bulk in Maine, while much later than that given for Wisconsin and Minnesota, is taken from thirty-four records; probably a larger number of dates would make it earlier, and consequently show a longer period of summer residence in that section:

Locality.	Av. Date When First Seen.	Av. Date When Common.	Av. Date When Bulk Depart	Av. Date When Last Seen.	Av. Period of Summer Residence.
S. E. Penn'a.....	March 21	April 8	Oct. 9	Oct. 27	189 days.
New York.....	April 7	" 12	" 3	" 6	174 "
Maine.....	" 17	" 27	Sept. 26	" 2	152 "
S. W. Penn'a, Ohio, Indiana, Illinois.	March 15	" 3	Oct. 13	" 26	193 "
Iowa.....	" 22	" 3	" 2	" 25	185 "
Wis. and Minn....	April 5	" 8	" 2	" 9	177 "

MIGRATION.

Exclusive of the work of the United States Biological Survey but little effort has been made in this country toward detailed co-operative investigations on a large scale of this phenomenon; therefore the finished systematized report produced from the vast mass of accumulated data should be the most important publication ever issued by that branch. We know very little of the migratory habits of the Flicker beyond that it occurs in large loose flocks by night, published data being meagre; under the circumstances no excuse need be offered for the tabulated forms, incomplete as they are, owing to the varied terms of years, 1875 to 1899, and fragmentary nature of the reports. In spite of all that has been said to the contrary, the homing instinct must have much to do with the annual northward movement and the alleged failure of the food supply has less to do with the retrograde movement than the approach of cold and stormy weather and consequent disappearance of sheltering foliage. In common with a large number of our birds, the Flicker is peculiarly sensitive to meteorological changes which govern its movements to a large extent. The discussion of the probable causes of the semi-annual restlessness and irresistible impulse to move to more favorable climes lies beyond the scope of this paper. If migration consisted of a uniform dispersion and progression throughout the country instead of lines of flight along the coast, rivers and valleys and in irregular waves, the significance of the dates would be more apparent; as it is, a record may be that of the arrival of a Summer resident or transient, according to the remoteness or proximity to the line of flight. W. W. Cooke in "Bird Migration in the Mississippi Valley," states that the Flicker travels faster on the east than the west side of the Mississippi river. He estimates its average daily speed at about 12 miles. My calculations place the relative speed at about the same figure, but varying according to season

and weather conditions from 7 to 48 miles per night. It is absolutely certain that it does not move steadily night after night, but only as the weather permits or necessitates and its physical condition allows; the actual distance covered in a night's journey is therefore much greater than at first apparent.

Vernal. During January and February it is found in flocks of fifty or more individuals in Charleston, S. C. (Wayne), and the forward movement takes place in the first mild weather; the forerunner appearing at Berwyn as early as Feb. 2 or as late as April 6, according to the promises of the season, correlating in a measure with the date at which the first frog is heard peeping. The first arrivals are often solitary birds, frequently hardy old males, that have wintered nearby, accounting for the irregularity of first appearance.

Locality.	1892	1893	1894	1895	1896	Aver.	No. Yrs.	Earliest	Latest
Berwyn, Pa.	Feb. 25	.....	Mar. 20	Apr. 2	Mar. 30	Mar. 13	10	Feb. 2	Apr. 6
Germantown, Pa.	.....	.....	.....	.....	.....	.....	.....	Mar. 13	Mar. 25
Croton Falls, N.Y.	Apr. 4	Apr. 6	Mar. 22	Apr. 6	Apr. 12	Apr. 6	7	Mar. 22	Apr. 14
Cincinnatus, N.Y.	.....	Apr 5	.....	Apr. 9	Apr. 14	Apr. 13	6	Apr. 5	Apr. 20
Penn Yan, N. Y.	Apr. 3	Apr. 4	.....	.....	.....	Apr. 8	10	Mar. 21	Apr. 18
Toronto, Ont.	Apr. 21	.....	.....	.....	Apr. 26	.....	.....	.....	.....
Westbrook, Me.	Apr. 6	Apr. 8	.....	Apr. 20	.....	Apr. 12	7	Apr. 4	Apr. 20
Cornish, Me.	Apr. 9	.....	Scarce	Apr. 22	Apr. 15	Apr. 15	5	Apr. 9	Apr. 27
N. Brighton, Me.	.....	.....	.....	Apr. 26	Apr. 20	Apr. 21	10	Apr. 12	Apr. 28
Pittsfield, Me.	Apr. 6	Apr. 22	Apr 18.	Apr. 21	Apr. 15	Apr. 18	7	Apr. 6	Apr. 23
Bangor, Me.	Apr. 6	.....	.....	Apr. 20	Apr. 22	.....	.....	.....	.....
Waynesburg, Pa.	Mar. 27	Mar. 25	Mar. 19	Jan. 21	.....	Mar. 2	6	Jan. 21	Mar. 27
Oberlin, O.	.....	.....	Mar. 5	Feb. 26	.....	.....	.....	.....	.....
Wady Petra, Ill.	.....	.....	Mar. 8	Feb. 28	Feb. 24	Mar. 2	3	Feb. 24	Mar. 8
Glen Ellyn, Ill.	.....	Mar. 26	Mar. 25	Apr. 1	Apr. 5	Mar. 29	4	Mar. 25	Apr. 5
Delavan, Wis.	Apr. 2	.....	Mar. 18	Apr. 2	Mar. 31	Mar. 29	4	Mar. 31	Apr. 2
Mt. Sterling, Wis.	.....	.....	Mar. 22	Mar. 31	.....	.....	.....	.....	.....
Meridian, Wis.	.....	Apr. 3	Apr. 2	Mar. 24	Mar. 20	Apr. 3	6	Mar. 24	Apr. 13
Beatrice, Neb.	.....	.....	Feb. 17	Feb. 27	.....	.....	.....	.....	.....
Odell, Neb.	.....	.....	Apr. 4	Apr. 20	.....	.....	.....	.....	.....
Iowa City, Iowa	.....	.....	Mar. 10	Mar. 4	Mar. 5	Mar. 6	3	.....	.....
Grinnell, Iowa	.....	.....	.....	.....	.....	Mar. 30	6	Feb. 18	Apr. 3
Perry, Iowa	.....	.....	Mar. 19	Apr. 2	.....	.....	.....	.....	.....
Waseca, Minn.	Apr. 3	Mar. 28	.....	.....	.....	Apr. 2	12	Mar. 21	Apr. 9

Narbeth, Pa., March 20 '95; Vincennes, Ind., about March 9; Forest City, Ia., Feb. 14 ('91); Dawson, Y. T., May 22 ('99).

The condition of the weather has much to do with the irregularity, as it has been observed that of the earlier records those of January and February especially were made in mild open weather, while the latter dates with one exception were made after a season of irregular weather; March '93, however, was generally open and mild, yet it did not put in appearance until the 25th; the next day more arrived, and in a

few days it became common. It returns each succeeding year to the same locality (Jacobs). It often makes its first appearance at Iowa City, Iowa, in small flocks; at Delavan, Wis., in pairs or small bunches, and at Meridian, Wis., often in quite large flocks, at other times in pairs or families.

The bulk ordinarily arrives between two and three weeks later, in Pennsylvania and Illinois, but the number of days intervening gradually diminishes as it moves northward, and the van leads by scarcely a week in the northern tier of states. As far as I have observed, the males appear before the females, and the migrations are conducted in small companies, these forming the bulk of transients; while like most all species migrating, there are forerunners and stragglers (Miller). At Berwyn, Pa., it becomes common soon after the hardy willow has unfolded its leaves, and about the time the fragrant spicewood blossoms, when the ants, spiders and beetles become active once more, and just in the height of the arbutus season. It appears to average earlier in the West than in the same latitude in the East.

Locality.	1892	1893	1894	1895	1896	Aver.	No. Yrs.	Earliest	Latest
Columbia, Pa.	.....	.....	.....	.....	.....	.....	.....	Apr. 1	Apr. 10
Berwyn, Pa.	.....	.....	Apr. 1	Apr. 20	Apr. 12	Apr. 1	11	Feb. 27	Apr. 21
Penn Yan, N. Y.	.....	.....	.....	.....	.....	Apr. 18	3	Apr. 17	Apr. 19
Cincinnatus, N.Y.	.....	Apr. 9	.....	Apr. 20	.....	.....	.....	.....	.....
Buffalo, N. Y.	.....	.....	.....	.....	.....	.....	.....	Apr. 10	Apr. 20
Westbrook, Me.	Apr. 21	Apr. 24	Apr. 22	.....	Apr. 18	Apr. 20	7	Apr. 18	Apr. 21
Cornish, Me.	.....	.....	Rare	Rare	Apr. 19	.....	.....	.....	.....
N. Brighton, Me.	.....	.....	.....	Apr. 22	Apr. 20	Apr. 21	10	Apr. 12	Apr. 28
Pittsfield, Me.	May 1	May 1	Apr. 28	May 1	Apr. 29	Apr. 29	7	Apr. 23	May 1
Waynesburg, Pa.	Apr. 1	.....	.....	.....	.....	Mar. 18	3	Mar. 12	Apr. 10
Oberlin, O.	.....	.....	Mar. 9	Apr. 5	Apr. 11	Mar. 21	6	Mar. 9	Apr. 11
Wady Petra, Ill.	.....	.....	Apr. 6	Apr. 3	.....	.....	.....	.....	.....
Glen Ellyn, Ill.	.....	Apr. 2	Mar. 25	Apr. 14	Apr. 12	Apr. 9	7	Mar. 25	Apr. 19
Delavan, Wis.	.....	.....	Mar. 21	Apr. 5	Apr. 2	Mar. 30	3	Mar. 21	Apr. 5
Mt. Sterling, Wis.	.....	.....	.....	Apr. 13	Apr. 2	.....	.....	.....	.....
Beatrice, Neb.	.....	.....	Apr. 13	Mar. 20	.....	.....	.....	Mar. 20	Apr. 13
Grinnell, Iowa.	.....	.....	.....	.....	.....	Mar. 28	5	Mar. 19	Apr. 1
Perry, Iowa.	.....	.....	.....	Mar. 30	.....	.....	.....	.....	.....
Waseca, Minn.	.....	Apr. 15	May 1	.....	.....	Apr. 11	6	Mar. 26	May 1

Boothby Harbor, Me., April 10 ('98); Vincennes, Ind., about the middle of March; Red Wing, Minn., last of March or first of April; Ramsey, Hennepin, Dakota and Washington counties, Minn., last of March to April 10. It is found sparingly during the Winter at Hillsboro, Ia. Feb. 24, '99, it began to increase, March 15th the great wave appeared, April 2, all gone except the goodly number that remain to breed. April 17, '98, when some twelve or fifteen miles off Cape Ann, at sea, a Flicker came aboard, perching for a few minutes on

the top sail before continuing its northerly course (Morrell). As numerous as and even more noisy than the Robins, during migrations, calling uneasily, flying from tree to tree, often in considerable companies. It is not confined to the woods, but is everywhere. This vast multitude passes northward within a week after arrival, leaving only the local breeders (Jones). Some notes taken in the Spring of '96 at Delavan, Wis., by Mr. Ned Hollister are interesting on account of the waves recorded; March 31, first heard at daybreak, calling loudly from the heavily wooded island in Delavan lake; five seen during the day in a walk over this island, all low down near underbrush between wood and marsh; April 1, about the same number in same place; April 2, common about lake; April 4, common everywhere around the shores, having steadily increased since first arrivals; in the morning, soon after the first signs of daybreak, it was heard calling from all sides. On moving into town none were observed until the 12th, when it became very abundant all at once, a perfect wave taking the place of a very large wave of Yellow-bellied Sapsuckers that had taken the town by storm the two previous days. The Flickers were everywhere, especially in the marshes, orchards and woodland; burnt marshes seem to be a favorite place, feeding on the ground in dozens and large flocks, far from water. April 19, 20 and 25, abundant; April 28, 29, common; April 30, abundant; after this date common until Fall.

During the season of 1895 there was a marked decrease in numbers in some localities: for instance, at Columbia and Berwyn, Pa., it became rather uncommon, and at Cornish, Me., from abundant to quite rare, none remaining to breed. At only one point was it particularly noticeable in the West, about Meridian, Wis., where the decrease was placed at 50 per cent at least. It seems almost incredible that so hardy and resourceful a bird should have suffered so severely from that long-to-be-remembered blizzard.

While the retrograde movements are conducted in larger numbers, being recruited by great numbers of birds of the year, it is scarcely as noticeable, lacking the noise and bustle of Spring arrivals. Like the Robin, its whole nature seems to have undergone a change. It no longer solicits notice by song or display of plumage, but becomes shy and suspicious,

and while gregarious to a great extent, in flight every one is capable of looking out for itself. The mature birds are the most wary, and by example prepare the young for the dangers of migration and Winter residence in the South, where it is constantly menaced by hunters. Acknowledging the difficulties in the way, it seems to me that the departure of the bulk has been sadly neglected nevertheless. In this species at least its value over dates of last seen is apparent.

LOCALITY.	1893	1894	1895	1896	Average	No. Yr's	Earliest	Latest
Berwyn, Pa.	Oct. 19	Oct. 19	Oct. 5	Sept. 6	Oct. 9	7	Sept. 13	Oct. 19
Oberlin, O.	.....	.....	.....	Nov. 10	Nov. 14	4	Nov. 1	Dec. 6
Glen Ellyn, Ill.	Sept. 20	Sept. 25	Sept. 26	Sept. 20	Sept. 25	7	Sept. 20	Sept. 28
Delavan, Wis.	" 12	Oct. 7	.....	.....	Oct. 1	3	" 12	Oct. 12

At Buffalo, N. Y., the bulk retires in October; Dunrak, Pa., first week in October; Meridian, Wis., by Oct. 10; and the same date is given for Hillsboro, Ia. The departure of the bulk is always dependent upon weather and foliage. In '98 the foliage was unusually late in falling, but in '99 rather unusually early with some chilly weather in October (Jones). During the cold windy days in October at Taunton, Mass., it may be found in large numbers huddled together in hollows and sheltered localities, where it may be easily approached (Bent). The last seen are represented by a number of irregular dates.

LOCALITY.	1892	1893	1894	1895	1896	Aver.	No. Yrs.	Earliest	Latest
Bangor, Me.	.....	.....	.....	Sept. 28	.....	.....	.....	.....	Oct. 21
Pittsfield, Me.	.....	Sept. 30	.....	Sept. 29	Sept. 9	Sept. 27	5	Sept. 9	Oct. 6
Westbrook, Me.	Sept. 19	.....	.....	.....	.....	Oct. 11	4	Sept. 14	Nov. 28
Toronto, Ont.	Oct. 4	Oct. 11	none	.....	Oct. 1	Oct. 2	5	Sept. 25	Oct. 11
Cincinnatus, N.Y.	Oct. 6	.....	.....	.....	.....	.....	.....	.....	.....
Penn Yan, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	Dec. 29
Croton Falls, N.Y.	Oct. 4	Oct. 11	not seen	.....	.....	Nov. 4	3	Sept. 26	Oct. 11
Berwyn, Pa.	.....	Oct. 19	Oct. 19	.....	Nov. 12	Nov. 12	6	Oct. 19	Dec. 8
Waynesburg, Pa.	.....	.....	.....	.....	.....	.....	.....	Nov. 10	Dec. 10
Delavan, Wis.	Sept. 27	Sept. 19	Oct. 19	Oct. 18	.....	.....	4	Sept. 19	Oct. 18
Wady Petra, Ill.	.....	.....	Oct. 15	Oct. 21	.....	.....	.....	.....	.....
Perry, Iowa	.....	Nov. 18	Dec. 22	Sept. 4	.....	.....	.....	.....	.....
Grinnell, Iowa	.....	.....	.....	.....	.....	Oct. 22	5	Oct. 5	Nov. 21

At Croton Falls, N. Y., not present during the fall of '91 and '94; Dunrak, Pa., last by October 15; Germantown and Narberth, Pa., by last of October; St. Paul, Minn., late in October, one lingering until November 7, '95; Iowa City, Iowa, and Glen Ellyn, Ill., last week in October; Hillsboro, Iowa, November 6, '99, all but the few that winter.

FLIGHT.

Its usual flight is undulating, so characteristic of the Woodpecker family as well as the Crossbills, many of our Finches and some other species. While gaining headway its wings beat the air rapidly, producing a whistling sound which, upon gaining sufficient altitude and velocity, apparently ceases altogether, recurring only when about to alight. Perhaps this noise is only an audible manifestation of its almost perpetual bustle and restlessness, as I have known it upon rare occasions to take flight or alight within a few feet of me with the stealth and noiselessness of an Owl. When flying in flocks, which by the way are never compact, it does not act with the unity of action of the majority of our birds; still there is considerable regularity of length and inflection of the waves produced by the alternate opening and closing of the wings. During '96 I took the following notes: June 25, one flushed at road-side, rose twenty feet at a distance of seventy-five feet —just clearing the comb of a small barn—making five dips of about three feet or one dip every fifteen feet on an average. One flushed from creek bank and flew to ground again. Ten feet rise in forty feet, making two dips of less than one-half foot. August 1, several flushed from ground. Ten feet rise in forty feet, two dips of about three feet or one dip every twenty feet. It is capable of greatly increasing its usual speed and sustaining itself with little or no undulation but seldom rising to any great height above the tree tops except when migrating. Alighting is best accomplished by a slightly upward movement, and when at right angles to its perch the tail plays an important part in the rather awkward feat of balancing, suggesting a comparatively recent aquirement and one not attained by the true Woodpeckers.

ROOSTING.

I do not know how much proof can be offered in support of the popular belief that it habitually roosts in the tree cavities. While it is to be inferred that it frequently does so in cold or stormy weather whenever suitable chambers are available, yet I very much doubt whether accommodations could be found within reasonable distances for more than five per cent. of the number flocking previous to the autumnal migrations as well as the winter season in the south. During the warm summer months it is reasonable to suppose that it would prefer the open air to the hot and stuffy chamber of wood, except of course the short period necessary to hatch and protect callow young.

Alexander Wilson relates how a captive slept in a perpendicular position with its head under its wing. An interesting observation comes from Mexico, Missouri: On a cold blustry evening of the spring of '94, a Flicker was observed roosting on the south-west side of the bare trunk of an elm close to the house. The year following, on the warm and balmy evening of April 9th, another bird flew into the same elm and with a little scrambling and investigation it disappeared behind the trunk to a nich a little below the crotch of two upright limbs, with its whole body in contact with the bark of the tree and its neck shortened back into its body—it was evidently in a roosting position. Now as it was not known whether the previous visitor had staid all night, this one was carefully and perhaps too closely watched, as it left at the call of a passing mate. The next night was cooler with a north-east wind and a lowering misty vapor in the west, but not very threatening. At 6:30 the same or another female alighted and quietly shuffled around on the south side to the identical spot occupied for a time the previous evening, but at 7 o'clack it too had vanished.—J. Newton Baskett. Bendire quotes a Maine correspondent who once found a Ficker asleep on the outside of

a tree one moon-light night; as there was no bird on the nest, it roosted in that position from choice. At Oberlin College a single bird roosted between the vertical water pipe and wall of Spear Library for two successive winters, and another occupied the cupola of the Theological Seminary the succeeding winter. —Prof. Lynds Jones. A correspondent makes note of it cutting its way through weather boarding of vacant summer residences at Cape Cod for no apparent reason except for shelter, and at Taunton seeking shelter in the deep evergreen swamps or excavating winter quarters in the sawdust lining of ice houses. It has also been known to roost in hollow trees, outbuildings about farm houses and unused chimneys during the coldest seasons.

DRUM CALLS.

This form of instrumental music is a by no means insignificant addition to the Flicker's repertoire. It is a musical long roll of vibrant, far reaching effect, sometimes evidently demanding an answer as the bird will assume a listening attitude, and at other times preceeding or succeeding a vocal call or song. In the spring time it is a very popular means of attracting the attention of a mate or sounding an assembly. It is seldom heard after the nesting season has well progressed and ends before the young have hatched. J. N. Baskett states that in drumming the beak is struck directly end-on against the resonant body as shown by an examination of a soft pine box which was frequently used. The box was nailed to a tree and by slipping up and throwing a hat over the bird while it was clattering away, it was finally caught. Either it or another one was drumming again the next day. Chief Simon Pokagon relates a little incident which must not be lost. In his own words: "I asked a class of Indian boys what kind of music they liked best. One said '*Pe-nay-shen*' (Bird) music. I then asked each one what kind they liked best of all the birds. One replied '*Au-pe-tahe*' (Robin), another '*Tchiu-dees*' (Blue Jay), another '*Au-nawk*' (Thrasher), another '*We-bin-gwan-Pe-ney-shen*' (Bluebird), and to the smallest in the class I said '*Que-we-zaynes*' (My boy) 'what one pleases you the best?' He quickly replied '*O-zaw-wan-day Paw-Paw-say*' (Golden-winged Woodpecker). I said 'Why so my little boy?' He quickly answered 'Oh him am such a *me-no* (good) *Tom-mer Tom-mer* (drummer.)' Accent almost invariably on last syllable."

VOICE.

The Flicker has a much greater vocabulary and more modes of expression than any other of our North American Woodpeckers, and while the contrast between its so-called song and the inspiring melody of our tree songsters is ever so great, its voice blends harmoniously with the many other voices and sounds of nature without which the hill, meadow and grove would lose much of their charms. Individuality now and then cropping out during and immediately after mating and the earlier part of the breeding season, appearing to be constantly varying and improving, seeking to give expression to its feelings.

Perhaps it is unwise to devote much space to this subject however enticing it may be, for but few have given enough time and thought to it to be classed as competent reporters; then the variability of the notes according to locality adds another difficulty. However, as its notoriety has been largely gained through its versatile voice, it would not do to pass over this fascinating study without an attempt to condense and render intelligible the notes in my possession. For brevity and convenience I have separated them under Calls, Conversational Notes, Common, Scythe-whetting, Flicker and Wake-up Songs.

Calls. The vocal call is usually high pitched and penetrating. It is a note characteristic of no particular season and when uttered in a startling shriek which may be heard at a distance of almost half a mile or subdued to a soft but impatient inquiry unnoticed a hundred yards away, it serves as a call or answer to comrade, mate or young, challenge to rival, or precedes the song as an imperative demand for attention. Ordinarily a *chu*, *ka*, *che-u che-ah*, or *chu-ah* in New York and Pennsylvania, and in the northern part of the first state often sounding like *clape* and *kee-yer*. In New England—*pea-up*, *ye-up*, *ye-a-up*, *yar-r-r-up*, *pee-up*, *kru* and *que-ah*. In Georgia

—*wake-up*. Missouri—*cheer*. Illinois—*flicker*. Iowa—*kee'-yer*. There are evidently answers to all calls and it is a question whether one sex has a note not possessed by the other.—J. Newton Baskett. During a calm day it may be heard calling *clape* nearly a mile to windward.—H. E. Miller.

Conversational or Soliloquizing Notes. These are neither calls nor songs and are evidently not intended for the ears of the public, commonly a scanny, gurgling, almost involuntary *chur-r-r-r* as danger seems to threaten it when on the wing, or when flushed from the ground or just before a-lighting, which may be interpreted as a note of warning or announcement of arrival according to the circumstances. I have heard a low guttural *who-del* as it endeavored to balance itself on a slender branch immediately after arrival. At Wady Petra, Illinois, an old male who spent three successive winters close at hand, usually sat on the house roof for a time in the early morning. On December 1st, '94, he uttered an odd gutteral call of *huck-a-woo'-ah* or again only *woo woo* evidently for his own edification.—Virginius H. Chase. At Croton Falls, New York, a low and soft *a-claupee* belongs exclusively to the nesting season.—H. E. Miller. From Ponkapog, Mass., we have another note: On September 12, '94, an adult and four young flew on a tree overhead, uttering a soft measured *sic-err* several times. While making these notes they seemed to be in a sort of ecstacy, holding the limb firmly, spreading their tails, drooping their wings, stretching their necks, pointing their beaks upward and throwing their heads this way and that in a quick, graceful manner, keeping perfect time to the notes.—J. H. Bowles.

Common or Cackling Song. This undergoes but few modifications, being a simple *ka* or *cuh* repeated more or less rapidly from six to thirty-five or more times in a loud full voice, rising and falling regularly as the notes are inhaled or exhaled. To correspondents in Massachusetts and Michigan its song sounds like *wet-wet-wet*, while to others in the former state it is *yip-a-yip* or *woit-a-woit*, and in Iowa *hee-chu*, repeated over and over again. Its song reminds me of that occasionally emitted from the throat of our common domestic hen, although the latter is a tame and feeble imitation in comparison. It begins in Southern Pennsylvania on the first

mild day in March and increasing in length, frequency and rapidity as the season progresses, with intervals of depression during cold or stormy weather, until about April 10th when it becomes monotonous, the notes often being uttered at the rate of four or five to the second; this continues until about the 20th, after which it becomes infrequent, much shorter and rather subdued in tone, until nest building, incubation and care of young claim its undivided attention and the song is restricted as much from caution as from any thing else, it is only semi-occasional until late in June when the young are well along; it revives once more for a few days in a brief early morning—5:30 to 7:15—or before or after shower song. As a cooler day appears in August or September it becomes more frequent and even lively, especially after a refreshing shower, but by the first week in October is heard no more. A careful observer at Perry and Madison, Wisconsin, has arrived at about the same conclusion, i. e., it begins the cackling song in the country previous to the towns, is more clamorous in the morning and evening, almost ceasing after it becomes well mated, and cropping out again in the months of August and September.—J. Eugene Law.

Love or Breeding Songs. The last three songs are essentually of this character. I am aware that some are mating notes only while the active breeding season claims others exclusively, yet I am unable to make such separation. The **Scythe-whetting or Rollicking Song** is probably a form of greeting as well as love, as it is uttered when two or more meet. It has been likened to the sound produced by the sharpening of a scythe, and is a sharp metallic *wich-er*, *wich-ah*, *wick-ah*, *wee-chee*, *ka-wick*, or *co-flick* of the New England and Middle States; *quit-lo* and *quit-tu*, of Ohio; *hurrick-ah*, of Minnesota; *lse-wet* and *chuck-a-chuck*, of Iowa, repeated from two to twelve times. The **Flicker Song** is so hopelessly entangled and interwoven with the **Scythe-whetting Song** as hardly worth recognizing as separate when all the localities are taken into consideration. The **Wake-up Song** is less frequently uttered, and is the same throughout the north, from Maine to Iowa, as an oft-repeated *wake-up*, *wa-cup*, *we-cup*, *we-cough*, *wick-up*, *wick-ah*, or *hick-up*, and in Georgia *chuck-up*; great emphasis being laid on one or the other syllables, usually the first. I regard

I APPEND TABLES IN ORDER THAT THE READER MAY OBSERVE THE PROGRESS AND DURATION OF THE SONG PERIOD AS WELL AS CORRELATIVE DATA FOR NEARLY TWO SEASONS AT BERWYN, CHESTER COUNTY, PENNSYLVANIA.

DATE.	NO. OF BIRDS.	WEATHER CONDITIONS.	COMMON SONG.	OTHER SONGS, CALLS, ETC.
1897				
March 22 3	3-5	Warm and cloudy	Occasional, 6 to 10 notes duration	Several drum calls
" 26	2	Cold N. W. wind		Call at 2 P. M. Drum call at 6 P. M
" 30	6	Very warm. Fair	Throughout day. Not more than 6 notes	
" 31	6	Warm, fair, brisk N. E. winds	Frequent 6 to 10 notes duration	Several drum calls
April 2	2	Warm, fair, wind N. shifting E	A trifle longer during day	" " "
" 3	4	Warm, fair, wind East	8 12 notes repeated slowly	" " "
" 4	8	Cloudy, mild, rain at 4 P. M	Loud, long, rapid and frequent. 12-35 notes	*Wicker* twice in succession. One or two calls.
" 5	8	Rain until 10 A. M. Fair until 6 P. M.	Loud, long, rapid and frequent. 25-35 notes	Two calls. Frequent drum calls
" 6-7	2-2	Cloudy, some rain, cooler	Short and infrequent	
" 8	4	Cloudy, rain from 1 P. M. to night	Longer and faster. 12-20 notes	
" 9-11	3	Rain and fog or fair and cool	Short	
" 12	2	Cloudy A. M. Fair P. M	Louder and longer P. M.	
" 15	2	Rain, cloudy	Much longer	*Wick-up* frequent at 3 P. M
" 16	15	Fair, mild	Frequent. Monotonous	*Wicup, wick-up* and *wicker* common
" 18	9	Fair, warm	Frequent. Very long	*Wick-up* frequent. Calls common
" 20	7	Freezing A. M. Very warm P. M	Once in A. M. Frequent in P. M	*Wick-up* several times
" 21 26			Shorter and fainter	Probably excavating nests
" 29	5	Fair and mild	Renewed, long and lively	
May 1 10			Occasional, neither loud nor long	Probably incubating
" 11			Increasing in force and length	
" 12 26			Occasional early A. M. or before or after rain	
" 27-31			An increase	Probably young well along
June 10	8	Fair. North breeze	Frequent	*Wick-up* once. Several calls
" 12 25			Infrequent	
July 4-9			Infrequent. Short duration	
" 11 17			Short and broken, before 8 A.M. after 5:30 P.M.	
" 19 20			One short song	
August 1, 3, 16				Short *wicker* song

DATE.	NO. OF BIRDS.	WEATHER CONDITIONS.	COMMON SONGS.	OTHER SONGS, CALLS, ETC.
1898				
February 10, 13	1-1	Fair, mild		Calls
March 16	1	Cloudy, mild	At 7 A. M. 6 8 notes duration	
" 21	2	Rain, cooler	At 10 to 11 A. M. 6 10 notes after rain	
" 21	3	Threatening, warm	4 to 8 notes duration	Calls
" 27	10	Cloudy, warm	All day. 6 12 notes, once 28 notes	*Ka-wick* and *kick-up* songs, calls and drums
" 30	4	Cloudy, mild	8 to 12 notes duration	Calls and drums
April 3	2	Cloudy, cold	Short and few	Short *Ker-wick* 4 P. M. Calls
" 8	1	Cold and blustry	" " "	Few calls
" 9	3	Fair, mild	More frequent. 8 20 notes	
" 10	1	Mild, showery	More frequent. 12-22 notes	
" 11	4	Mild, cloudy	Frequent. 12-24 notes	
" 12 13	2	Fair, warm	Frequent. 16-24 notes	*Wi-cup* song
" 14	2	Mild, raining at 4 P. M.	Short duration	
" 15	1	Cold and windy		Calls
" 17	6	Fair, windy	Frequent. 12-20 notes	Much drumming between mates
" 18	9	" "	Frequent. 10-24 notes	Much drumming. Nearly all appear mated
" 19	2	Cold, showery	Infrequent	Drum calls
" 20	12	Cold, windy	Common at any time. 16-32 notes	*Wicker* and *wick-cough* notes. Long drums
" 21	14	Showers and squalls	Less frequent	Several *wickup* songs. Drum calls
" 22	10	Mild, cloudy	Common. 20-30 notes	Frequent *wickup* songs. Much drumming
" 26	5		Frequent	*Ka-wick* and *wick-ka* song at 6 a. m.
May 1-14			Short or silent	Silent except occasional call
" 18, 23, 27			Frequent	
" 28 31			Not frequent	
June 1 8, 17, 28			Occasional, short duration	

this song as by far the most musical of any of its attempts in this line. On May 16, '96, I heard an apparently rare variation, a metallic *ka-wick-wick-wick-wick-wick-wick-wick-wick-wick-wick-ka* by the male while close to the nest.

Quite a number of birds have certain cries which might easily be mistaken for the Flicker's notes. Bendire and others mention the following: Groove-billed Ani, *Crotophaga ani*, Yellow-billed Cuckoo, *Coccyzus americanus*, Pileated Woodpecker, *Ceophlœus pileatus*, Blue Jay, *Cyanocitta cristata*, Long-crested Jay, *C. stelleri macrolopha*, and Oberholser in **"Birds of Wayne County, Ohio,"** states that the imitation by the Cardinal, *Cardinalis cardinalis*, was so perfect as to almost induce an erroneous note book entry.

MATING.

Immediately after the arrival of a sufficient number of local birds, (the females appearing last), and the advent of milder days, courtship commences and continues with increasing vigor for two or three weeks. It is elaborate and ceremonious, often bordering the amusing and ridiculous. The male alights close to the female, often choosing a rather slender and leafless horizontal branch as best suited to an unobstructed view of his graceful form and gay plumage. The female assumes indifference or the silence, dignity and alertness of a critic, while the male bowing, hopping, prancing, dancing, strutting, flirting his wings, pleads and urges his suit with flickering, wacuping and hickcuping notes; finally he sidles up to her, she coyly sidles away, and perhaps takes wing, followed by the one or more suiters to another tree, where the whole performance is repeated. There are sometimes from two to five males, between whom sharp but apparently harmless encounters occasionally take place while in the air, determining, as one correspondent suggests, which one shall next offer his attentions. In due time the female shows her preference, and not infrequently joins in with the bowing and singing of her accepted lover, and if the rejected suitors have not already left in pursuit of some other unmated female, the pair unite in driving them from the premises. As Audubon has stated that the Flicker never fights, it is befitting that we insert some of the testimony at hand: I have not observed the males fighting among themselves for possession of the females, but they display a good deal of friendly rivalry in their efforts to display their good points and in paying attention to the desired females.—Angus Gaines. It is only when approaching the female that the male gives utterance to the familiar and highly sentimental *chuck-a-chuck-a-chuck*, etc., all the while sidling up to her as she sidles away. I have seen the pair make the circuit of a tree several times. It is rare that a rival male molests the actor until the

female takes flight, and then he at once pounces upon him.—Lynds Jones. That the males do not always conduct the courtship is proven by Mr. Benj. T. Gault's experience while collecting in the sunken lands of Arkansas and Missouri the St. Francis river region. He says: On March 3rd, '91, while visiting Griffin island, on the Arkansas side of the river, my attention was drawn to a small troop of these birds, four in number, clustered together near the top of a dead snag. As other birds were interesting me at the time, slight attention was given to them, but on returning to the same spot an hour or so afterwards, and finding them still there, my glasses were turned upon them; somewhat to my surprise the lot, consisted of three females and one male, the latter holding the most exalted position on the snag, the evident pride of the gentler sex, who were indulging in quite an animated discussion, idolizing his lordship—so to speak—but in tones so low they were scarcely audible from where I stood. I more than judged their earnest intentions by the peculiar swaying motions of their heads, which were very amusing to witness. Never having seen the female do the waiting upon before or since that time, I think their actions were a little out of the ordinary. J. N. Baskett describes a similar scene of two females courting a male, in the *Osprey*. These are the only instances on record, I believe.

When mated the birds become very affectionate and inseparable, few of our native birds excelling them in this respect. It is constantly calling or answering, the male drumming a long rolling call and singing the common song at the top of his voice to equal or excell that of his nearest neighbor; when suddenly missing the female, his calls amount to a perfect shriek, and an answer results in a swift galloping flight as he gurgles a scanny exclamation; alighting beside her he indulges in a series of bows and *we-cup* notes, in which she joins for a time. As the more serious side of life begins, the selection and construction of a nesting place, he becomes less and less noisy, and finally almost silent altogether, except the early morning and before or after shower song, although fully as attentive and helpful to his mate as ever.

NIDIFICATION.

Situation of Nest.—I fail to discover any great uniformity in the choice of nesting places throughout its breeding range, which is not surprising, considering the well known capabilities of the bird for adapting itself to existing conditions, and which indeed is absolutely essential in a species so abundant numerically and ranging over so wide and diversified a territory. On Avery's Island, La., it seems to prefer trees near the edge of the woods, occasionally close to water or in yards or pastures. In the South Atlantic States the lowland pine forests, usually a dead pine, now and then an oak, apple, maple, chinaberry, ash, beech, willow, palmetto, or an unrecognizable stub. Mr. W. L. Foxhall calls to mind one dead pine, perforated with 25 or 30 holes, most of which were in use at one time or another. In the Middle and Eastern States: apple, sycamore, oak, butternut, cherry, elm, chestnut, maple, poplar, beech, ash, pine, hickory, etc. In Southwestern Pennsylvania Mr. J. Warren Jacobs has found the choice to be about as follows: 1st, along streams and in orchards; 2nd, pasture fields on hillsides; 3rd, in woods. He has also found the sycamore to be the favorite, with the apple and maple second, the beech and locust third, oak and cherry fourth, and all other varieties fifth. At Croton Falls, N. Y., it appears to have no marked preference, as it is found in the low wet meadows and again in the highest and dryest woodland, the fruit trees in orchards and the willows bordering the water appear favorites; while about Cincinnatus and Buffalo the edge of woods, groves, orchards or isolated trees, always in dead wood, have their claims. Mr. C. L. Rawson used to fancy that it preferred apple trees at Norwich, Conn., but old orchards disappear and no particular tree now seems to be the favorite. At Fitchville a row of old elms are now the homes of half a dozen Wacups. At Taunton, Mass., it selects perfectly sound apple trees, occasionally an ash, oak or walnut in an open field;

while about Ponkapog it breeds in orchards, swamps, thinly or densely wooded ground, with only one instance of a living evergreen, but any other tree living or dead. At Cornish Me., all found in trees standing away from the thick woods, mostly apple orchards; and about Pittsfield, almost any locality, except perhaps the deeper woods, along the shores of the ponds, especially in overflowed ash swamps it is found. From Ohio westward the apple orchard is a favorite with the poplar, willow, maple, oak, elm, walnut, cottonwood, etc., more or less resorted to, according to availability. Mr. R. M. Strong states that, like many other species, it is rapidly adapting itself to civilization, and gives an instance of a bird excavating a nest about five feet up in the trunk of a shade tree standing on one of the most traveled streets of Oberlin, Ohio. At Glen Ellyn, Ill., Mr. Benj. T. Gault has found that in addition to old and neglected orchard trees, old and partly decayed white oaks, black jacks, and both dead and living elms and poplar are usually selected. At Iowa City, Ia., Mr. Paul Bartsch says that while orchards are the favorite, at times it seeks a more lofty location, such as is afforded by the bare approaches of that giant of the forest, the sycamore; and at Grinnell the favorite trees are the box elder, linden, soft maple, cottonwood, white willow, poplar, in the order named, and in fact almost any tree if it is sufficiently decayed to be easily worked. Summing up the evidence, it is found to be an inhabitant of the open country rather than the deep woods in the north and west.

The preceding may be called the natural nesting sites, but at the same time does not complete the list of available situations for this remarkable bird. Gate posts, fence posts, telegraph, telephone and electric light posts are frequently utilized on the treeless islands and beaches of the east as well as the prairies of the west. Mr. J. H. Bowles writes that on Cape Cod large numbers of poles are literally honeycombed with holes, some of which are used for nesting purposes. It has been found breeding far out on the prairie in an old wagon hub, surrounded by weeds; also in barrels, and one instance of an excavation of the regulation size in a hay stack is on record; another nested in a crevice of an unused chimney for several years; and stranger yet it has been found more than

nice occupying Kingfisher's and enlarged Bank Swallow's burrows. It often cuts through the weather boarding of ice-houses, and burrowing in the sawdust lining, lays it eggs, as well as utilizing for the same purpose enclosed cornices, gables, hollow columns, etc., of dwellings and other buildings; not uncommonly in the east and quite frequently in the west. Mr. G. F. Breninger gave an account of the Flicker cutting holes in a 65-foot church tower at Beattie, Kans., and building on the timbers within, six pairs bringing forth young. In response to an inquiry he has given me fuller particulars. The holes were cut through the shingles near the top of the tower and the eggs deposited on the timbers within. The orifice being so small as not to admit of even a small boy getting at them, it was impossible to ascertain whether any cavity was dug into the timber or any material used for nests. He has observed the same trait carried into effect by the California Woodpecker in a church tower at Oreville, Cal. Rev. P. B. Peabody gives some interesting data, showing how it modifies its habits when resorting to localities where the usual nesting conditions are well nigh impossible. In Southwestern Minnesota, where there is very little timber in which it could nest, it has been found resorting quite commonly to the telegraph poles and the railway semaphores. One semaphore contained five holes, one of which was inhabited by a pair of Flickers, and another, just above it, by a pair of Tree Swallows at the time of observation. The holes in the telegraph poles appear very shallow, and generally at a height of not less than two or more than ten feet. Up in northern Minnesota the occupancy of the telegraph poles is quite common and the occupancy of buildings even commoner. For instance, the Church of St. Vincent has Flicker holes in the cornice of both gables. Last year it made a new excavation in the north gable while the Tree Swallows took possession of the south gable. The ice-houses of the Great Northern railroad are perforated with holes, as many as eight in the south end, which is very small. From Ottawa, Kans., comes the particulars of an almost unique nesting site. Mr. Burke H. Sinclair found a nest containing eggs in the garret of the town high school. The birds obtained entrance to this large three-story brick building by means of a displaced brick. As in all infloored lofts it consists

of nothing but the parallel rafters, with attached lath and plaster, which forms the ceiling of the room below. This frail floor is about ten inches below the entrance hole, and the nest was situated about one foot from and directly in front of the entrance. The place had evidently been used for several years, there being at least a peck of wood chippings, some fresh, but a large quantity old and discolored with age. The nest was placed between two of the parallel rafters and composed of these chippings, being about six inches thick by eighteen inches in diameter. This material had been all cut from the rafters on the floor and the roof overhead. There had been an infinite amount of labor, as large as 2×6 rafters, besides a large number of smaller studding, were chipped over half, and others entirely cut through. The birds seem to have been cutting at the rafters for amusement, as well as material, as everything in the immediate vicinity of the nest was strewn with chips. The male spent much of his time sitting in the entrance or demolishing the rafters; the pecking became so vigorous as to disturb classes in session below.

I regard this last instance as a much greater departure from the normal habits than any other known to me, as in all previously related instances it was compelled to cut through an outer shell after the manner natural to it, except in the occupancy of wagon hub, barrels, chimney crevice and the bank burrows, which differ in no material way in interior arrangement from hollows and burrows in trees. At this rate it appears within the range of possibility for it to breed in properly constructed bird boxes if protected and encouraged to do so.

POSITION.

Prof. Lynds Jones voices the general verdict when he affirms that the trunk of the tree is much preferred, but the main limbs are sometimes used. It seldom if ever carves out for itself a home in a perfectly sound hardwood tree. Soft punky stubs and trees that are entirely dead or have decayed portions are almost invariably selected. If the tree chosen is a large one, the excavation is confined to that side of the trunk in which the entrance is made. It excavates with the grain of the wood, so that if the trunk of the tree is slanting

the excavation will have the same slant. When the tree is leaning the entrance will be made on the under side, otherwise the rain would enter and fill the excavation. Once he found a nest in the horizontal branch of a tree not more than two feet from the main stem. The hole was bored in the side of the branch and carried at right angles toward the tree hole. The next year the same entrance was used, but the burrow dug out of the opposite side, the old cavity not being used at all. Natural cavities are sometimes chosen and the entrance enlarged. Once such a nest came to grief during a heavy rain, when it filled with water, ruining the eggs. As to distance from ground, he says it would be impossible to state any usual or preferred height, for there are none. Mr. Chase once found a nest in a willow post with entrance but twenty-two inches above the ground, and extending down until level with the surface. The height probably varies almost if not quite as much in one section as the other, but apparently averaging higher in the North and South Atlantic than in the Central Western States from data at hand:

South Atlantic States—	Maximum,	100 feet.	Minimum,	12 feet.
Middle & Eastern " —	"	60 "	"	2 "
Central Western " —	"	90 "	"	0 "

EXCAVATION.

House hunting begins shortly after the female has chosen her mate. The female leads, assiduously seconded by her partner, in a tour of inspection of all available sites, which often furnishes occupation for days. The following jottings from my note book for '96 are pertinent: April 15th, 9 A. M. —A female flew to old swamp willow, close to creek, and ran up main stem, examining some old cavities on the way; male arrived a minute later and went through the same performance, the female retiring meanwhile; both silent. At 9:30 the female flew directly to the top of the hollow stub, male followed directly after, uttering his love or scythe-whetting song upon alighting, in which the female occasionally joined, but soon left. At 10 o'clock the pair returned, singing common song on the top, apparently decided upon exact spot. Another pair went through the same ceremony on a tree further up the creek at 1:30 P. M. April 21st, three individuals

busy excavating nest cavities, very quiet; until May 16th constructing nests and depositing eggs, rather silent. When business of so much importance is under way there are no more loud rappings, cries or songs, but silence usually prevails in the immediate vicinity of its labors. If love notes are indulged in they are subdued in tone, and the bird stealthily chiseling at its dwelling will quietly creep around to the opposite side of the tree upon the approach of an intruder. Rarely a pair will appear bold and indifferent to observation. With its feet close together, holding on by its claws, and its body well braced by means of the stiff tail feathers, it swings backward and forward, showering yeomanlike blows on the spot selected. The circular hole, just large enough to admit the bird, but scarcely as neat and true as the best work of many others of the tribe, is tunneled in straight for about six inches, then turned down at right angles, and enlarged rapidly to the maximum diameter, which is, as Prof. Jones says, about twice the diameter of the entrance. Often it will chip out several inches above the entrance hole, for what purpose I am unable to more than conjecture. Maurice Thompson is authority for the statement that all of our Woodpeckers construct their nests in the form of a gradually widening pocket or gourd shape, except the Ivory-billed, which drills a jug-shaped cavity. Mr. Robert Windsor Smith describes a bird building her nest thirty feet up in an old post oak on June 10th, '93. The location was close to a public road and the Georgia railroad, near Duckwood, Georgia. In the formation of this nest the female did all the work ; in fact the male did not make his appearance. At the time of the discovery she had already made an excavation almost large enough to conceal her entire body. Often during the operations she would sink into the hole leaving about half her form exposed, remaining in that position but a moment when she would back out and resume her work as before. When a neighboring tree was rapped with a stick, she would creep around to the opposite side remaining there several minutes and peering around as if to learn the cause; if no other effort was made to disturb her she would again resume her place and continue the work unmindful of prying eyes as long as no demonstration was made against her. Wagons and other vehicles passed beneath her and several

reight trains went lumbering along, but she seemed unmindful of what was going on around her. Mr. Smith watched his bird for two days, when he was unavoidably called away for some ten or twelve days and on his return found that the tree had been cut down and carted away. Nearly all agree that both sexes assist in the work. Mr. Angus Gaines mentions a pair in particular, near neighbors and good friends of his, selecting a well seasoned snag, hard and tough, both birds working with a will, turns about, in constructing the nest hole, and returning to the same upon succeeding years. Mr. Francis R. Cope, Jr., says that in one nest he watched construction during the spring of '92, all the chips were carefully carried away some distance into a neighboring meadow; but in all other cases this precaution was not taken, the ground immediately around the foot of the tree being plentifully besprinkled with chips. In the first instance the male would work at the hole for about five minutes and then after carrying away all the chips, his place would be taken by the female, who in turn would labor diligently for another five minutes or so, always carefully carrying away every chip she made. In Iowa, Mr. Jones finds that it does not carry the chips from the excavation any distance from the nest, the chips being scattered broadcast, some falling at the foot of the tree. Mr. J. H. Bowles states that it will sometimes desert its nest when half finished and begin a new one, a trait so common with many of our Woodpeckers. Mr. Stephen J. Adams has found that it requires from one week to twenty days to complete this work and it is often carried on after the eggs are laid, enlarging and smoothing up the cavity, which accounts for the eggs found buried in "saw dust" now and then. Mr. James B. Purdy's experience has been that it takes about two weeks to complete the nest. On April 22nd a Nebraska bird was scared from her nest in a box alder when the cavity was ten inches deep, and on May 4th seven fresh eggs were collected from the hole, now twenty-two inches deep. Allowing a week for deposition, the additional twelve inches must have been hewn out in five days or less—something over two inches daily. When a pair has been robbed, Mr. J. Warren Jacobs finds that in most cases the hole is dug an inch or so deeper before another set of eggs is deposited; and Mr. C. H. Morrel reports

the depth of a cavity in an ash tree as but ten inches in '95, and deepened to twenty inches in '97, in both cases containing eggs.

An old nest is frequently used, thereby escaping days of hard labor, it being not uncommon for a pair to return year after year to the same cavity. Some years ago the late Dr. Willard L. Maris found it nesting in a hole in a tree situated in an open field near Melford, Penna., where for three or four years it successfully reared its broods, and after an interval of some three or four years he again examinad the nest — May 10, '94 — and was not disappointed in finding it occupied, but whether by the same pair it is of course impossible to say. This is but one of many instances of the kind. Messrs. James B. Purdy, J. N. Clark, James Savage and others have also made note of it.

Many of our birds owe to the Flicker their cozy homes in its deserted and oft times partly demolished breeding chambers. It occasionally furnishes nesting sites to at least one species of Ducks — Bufflehead (*Charitonetta albeola*); all of our smaller cavity nesting Hawks and Owls — Pigeon (*Falco columbarius*) and Sparrow Hawk (*F. sparverius*) and sub-species, Saw-whet (*Nyctala acadica*) and Screech Owl (*Megascops asio*) and sub-species; several Woodpeckers — Downy (*Dryobates pubescens*) and Red-head (*Melanerpes erythrocephalus*); one Flycatcher — Crested (*Myiarchus crinitus*); one Sparrow — European House (*Passer domesticus*); at least two Swallows — Tree (*Tachycineta bicolor*) and Purple Martin (*Progne subis*); our only cavity nesting Warbler — Prothonotary (*Protonotaria citrea*); many of our Wrens — Baird's (*Thryothorus bewickii bairdi*), House (*Troglodytes aedon*) and sub-species; Nuthatches — White-breasted (*Sitta carolinensis*), Red-breasted (*S. canadensis*) and Brown-headed (*S. pusilla*); Titmouse — Tufted (*Parus bicolor*), Black-capped (*P. atricapillus*) and Carolina (*P. carolinensis*); and Bluebird (*Sialia sialis*).

Composition. The lining or bed upon which the eggs are placed has been found to consist invariably of fine chips, probably the last made in smoothing up the chamber. If the wood is extra soft and punky, few if any fragments may be present, at other times some of the eggs will be almost buried

in the saw-dust-like chippings. No extraneous material is ever employed.

Dimensions. The data at hand is so incomplete as to admit of no constant comparison between different parts of the country, or living and dead trees, and hard and soft grained woods; but the depth of excavation appears to be least in the Southern states (6 to 14 inches), and greatest in New York and New England (10 to 36 inches), Illinois (14 to 24 inches), Pennsylvania (10 to 18 inches), and Minnesota (9 to 18 inches). The averages in general, together with the maximum and minimum measurements for the United States, are given in inches and hundredths. The difference in the methods of measuring are so great that much data other than the entrance diameter could scarcely be relied upon, but undoubtedly the depth of cavity depends in no small degree upon the quality of the wood.

	MIN.	MAX.	AVER.
Diameter of Entrance	2.20	5.00	3.28
Diameter of Cavity near Bottom	4.50	10.00	7.67
Depth of Cavity from Entrance	6.00	36.00	15.79
Total Length of Cavity	9.00	40.00	18.50

EGGS.

Deposition. Almost invariably an egg is laid daily until the clutch is complete. Indeed, such is the great fecundity of the species that it will often continue under exceptional circumstances to deposit an egg daily, with or without an occasional day of recoupment, until it multiplies the number in a typical set several times over, and that without a radical diminution of the properties of the egg. Records of even the most prolific of our wild birds laying more than a single egg daily are so few that an instance given by Mr. C. H. Morrell, Pittsfield, Maine, is of more than usual interest: On May 21st, '97, at about sunset a cavity in an ash slab was sawed into and the three eggs taken out, examined and returned; on the 26th it contained nine eggs, which were collected. It looks very much as if two eggs had been deposited in one day and from appearances all must have belonged to the same bird. Certainly no egg was overlooked upon the first visit.

Arrangement. The eggs usually remain in the position of deposition, becoming adjusted to the body during the frequent turning to which they are involuntarily subjected. When the cavity is small and the clutch large they are sometimes placed in two layers, the fine chips protecting them from injury. The arrangement of a heavily incubated set containing the unusual number of thirteen eggs taken by Mr. H. J. Flanagan in Providence Co., R. I., on May 30th, '98, was peculiar, if not unique. The entrance, eighteen inches above the nest, was about three and one-half feet above the ground, in an apple tree, and had been previously broken into so that the eggs were in plain sight. The trunk had been hollowed out to a diameter of ten inches or so, and the eggs laid in one row of five and two rows of four each. Two eggs which contained dead embryos appeared of a dark brown color. One was situated almost in the middle of the central row, and the other in the center of one of the outer rows, about one egg separating them.

Clutch. As a rule the minimum number of eggs in a set is found in the south, where the usual clutch appears to consist of but 5 or 6 eggs, a larger number being rather unusual. The whole north appears to be more favorable for the maintenance and development of much larger broods; most commonly 6 to 9 eggs are laid; sets of 10 not uncommonly, while 12, 13, and even 14 eggs are not wanting; larger sets are unknown, with one possible exception, published in the *Forest and Stream*, Vol. XXV., p. 427—a brood of 19 young, all alive and in good condition.

LOCALITIES.	NO. OF EGGS IN SET.										
	4	5	6	7	8	9	10	12	13	14	Total
N. C., S. C., Ga., Fla., Ala., La..	3	11	6	.....	2	.....	.....	.....	.....	.....	22
Del., Pa., N.J., N.Y., Ont. (Toronto)	3	9	21	17	10	11	1	3	.....	1	76
New England.....	2	4	5	2	20	3	6	.....	1	.....	43
O., Ind., Ill., So. Mich., Ky.....	2	1	3	4	1	2	1	.....	.....	.....	14
Wis., Minn., Ia., Neb., Kas.....	4	2	6	11	7	1	5	.....	.....	.....	36
Total.....	14	27	41	34	40	17	13	3	1	1	191

The southern bird makes up for the smallness of her set by producing a second brood in many instances. Mr. Arthur T. Wayne, Mt. Pleasant, S. C., says that two, and sometimes three broods, are reared in a season, a fact which has been noted by Bendire also.

Season's Aggregate. The Flicker has the reputation of laying more eggs under exceptional circumstances than any other species. Nearly every observer has something to say regarding this peculiarity and the persistence with which it is carried out. Mr. J. Warren Jacobs has found that on several occasions, when the eggs were taken before the set was completed, he has been rewarded with another egg on his return the next morning; and after laying 6 or 8 eggs, the bird rested a few days before beginning a new set. Mr. Paul Bartsch finds it to be a very patient and persistent layer; if one removes all the eggs except one from an incomplete set, and keeps this up day after day, the Flicker will try to complete the set, depositing egg after egg until her supply or patience is exhausted. He has in this way taken 17 eggs from one nest. Mr. J. H. Bowles stated that a friend once collected 25 eggs from one nest before the poor bird finally gave it up. Mr. J. B. Purdy

once found a nest in a cavity of an apple tree, and as soon as the first egg was deposited it was removed, and as fast as all subsequent eggs were laid they were removed; the bird continued to lay day after day until she had deposited 27 eggs. Mr. F. A. Colby has known it to lay as many as 28 eggs in a continuous stretch; a day perhaps was skipped after the boys robbed her, but she did not stop laying more than two days at a time when relieved of four to six eggs in a bunch. Rev. P. B. Peabody discovered a nest among a dense growth of black oaks, averaging about six inches in diameter. It was placed eighteen inches from the ground in a cavity, which, according to his remembrance, was partly natural and partly excavated by the birds, the depth being very slight. One or two eggs only were taken at the time at first, whereupon the mother Flicker, like so many others on record, began to spin out her "set" to the number of 30 or over before giving up in despair. Mr. J. H. Armfield reports the taking of a large number of eggs from a cavity in a maple tree near a spring, seven miles S. W. of Greensboro, N. C., in '98. Five eggs were collected on May 6th, and every two or three days thereafter all eggs found were gathered; the female continuing to lay, not every day, however, until July 5th, when she had deposited 48 eggs. This is the next to the largest on record. In relation to that historic and extraordinarily prolific bird of Taunton, Mass., little can be added to the meagre notes recorded by the collector at the time. The eggs were taken one at a time from a cavity in a willow, beginning May 6th, '86, leaving a nest egg, until 71 had been deposited. Mr. Chas. L. Phillips informs me that some of the eggs were accidentally broken and the remainder disposed of to Mr. F. B. Webster, the well known dealer, who in turn writes me that he has entirely lost sight of the Phillips collection, and has no means of tracing it, as it may have been broken up for decorative purposes. No measurements were taken, and while the collector is inclined to think they were all the product of one female, it is not impossible that a second bird whose own nest had been demolished, may have "jumped the claim" in preference to chiseling out a fresh nest so late in the season, and after one day's interval contributed her share to the grand total. Still, as Mr. Phillips argues, it is unlikely. It is unfortunate that this series of eggs was not better appre-

ciated for its scientific value. While this method of collecting eggs is hardly scientific and only justifiable in rare cases, permit me to advise the collector occasionally practicing it, to fix the identity of the female by means of some peculiarity of voice, habit, or plumage, if possible; and to carefully number and measure the eggs in the order of deposition, time on nest, etc. Collected from all sources we have the following:

Massachusetts.....15 eggs, taken in sets, no nest egg
Connecticut..... ...17 eggs, taken in sets, no nest egg
Pennsylvania.....17 eggs, taken in sets, no nest egg
Iowa.....17 eggs, taken singly, nest egg
New York.....20 eggs in 27 days, in sets, pigeon's nest egg
Connecticut..... .....21 eggs daily, nest egg
Massachusetts.....25 eggs daily
Michigan.....27 eggs daily, no nest egg
Massachusetts.....27 eggs, in sets
Vermont.....27 eggs, in sets
Nebraska.....28 eggs, in sets, no nest egg
Illinois.....28 eggs, singles and sets, nest egg
Pennsylvania.....30 eggs in 40 days, in sets, no nest egg
Minnesota..... 30 eggs daily
Indiana.....37 eggs in 49 days, in sets, no nest egg
Texas.....40 eggs in 40 days, no nest egg
North Carolina.....48 eggs in 65 days, no nest egg
Massachusetts.....71 eggs in 73 days, nest egg

Mr. C. L. Rawson, the veteran oologist, who is perhaps better known as "J. M. W.", of Norwich, Conn., has looked over some oological data, taken from field experiments made by himself and his climber since '76, and has come to the conclusion that the Flicker lays no more eggs in proportion to the usual number in a set when stimulated in some way, than many other species of various genera. Twice by the nest egg and at times by the substitution process he could take but 21 eggs from the Wacup, but in the same manner his notes say he has taken

11 eggs from the Common Tern (only one pair nesting on islet)..... .....Equal to 3 sets.
20 eggs from the Sora Rail (only one pair in bog).....Equal to 2 sets

32 eggs from the Bob-white (identification of same bird sure).....Equal to 3 sets
16 eggs from the Marsh Hawk.....Equal to 4 sets
17 eggs from the Sharp-shinned Hawk.....Equal to 5 sets
13 eggs from the Cooper's Hawk.....Equal to 3 sets
9 eggs from the Red-shouldered Hawk.....Equal to 3 sets
9 eggs from the Barred Owl.....Equal to 3 sets
21 eggs from the Flicker.....Equal to 3 sets
13 eggs from the Meadowlark.....Equal to 3 sets
11 eggs from the Purple Finch (besides 4 eggs of Cowbird).....Equal to 2 sets
12 eggs from the Vesper Sparrow.....Equal to 3 sets
16 eggs from the Parula Warbler.....Equal to 4 sets
20 eggs from the Long-billed Marsh Wren.....Equal to 3 sets

Numerous instances in which that pest, the European House Sparrow, has equaled or even exceeded the best ratio given by Mr. Rawson in the above interesting list, might be given.

Dates. The nesting period averages much later than is generally thought by writers. The time for fresh and complete sets varies of course, according to the season, but the following averages compiled from a large amount of data will be found in most instances to be approximately correct in average seasons:

Localities.	Average.	Variations.
N. C., S. C., Ga., Fla	May 4	April 10 to June 7
Penna., N. J.	" 15	" 28 " 26
N. Y., New Eng. (except Maine)	" 22	" 14 " 6
Maine, Ont., N. S.	" 30	May 14 " 18
Louisiana	" 7	" 5 to May 10
Ohio, Ind., Ill., So. Mich.	" 22?	" 2 to June 30
Iowa, Neb., Kans	" 10	April 24 to May 28
Minn., Wis.	" 18	May 10 to June 1
Alaska and N. W. Ter.	June 10	

Mr. Arthur T. Wayne finds the average date in South Carolina to be April 21st, except in '95 (a late season) when it was May 9th.

Shape. The contour is subject to little variation, the typical egg being ovate; now and then an oval specimen is found,

and more often sets in which the eggs are irregularly elliptical ovate, sometimes sharply pointed.

Color. Fresh eggs are a beautiful translucent white, the yolk showing through and suffusing the whole shell with a mellow delicate pink. When blown this pale wild rose bloom disappears, the shell retains the translucency in decreasing amount until it is dry when it is simply a pearly glittering white.—Lynds Jones. All colorless fine textured eggs, especially when fresh, seem to emit a faint glow and in this state are admired by field oologists more than the clear porcelain white specimens in the cabinet. Not rarely a set of prepared eggs show a creamy suffusion, which, if the cause was unknown, would deceive one into believing it to be naturally produced. If the eggs are left standing unblown for a number of days, the yolks will settle and the lining absorb enough coloring matter to stain it a uniform creamy-buff, which, showing through the semi-transparent shells, gives them the same appearance. With every reason for the belief that the prehistoric bird had a reptilian ancestry and that plain white eggs would most naturally be produced by the descendants of such progenitors for a time at least, uncolored eggs must be regarded as the least modified as far as external appearance goes. Some species advanced along the line of involuntary protective coloration of their eggs, while others habitually nesting in dark cavities, in large colonies or practically safe places, as the Petrels, Pelicans, Pigeons, Owls, Kingfishers, Woodpeckers, Swifts, Hummingbirds, etc., have undergone slight changes apparently. According to Dr. Brewer, "Any egg, always excepting a Woodpecker's, is liable to be marked (stained) by minute infusions of colored lymph of the parent in exclusion." On what grounds he excludes the Woodpeckers is purely conjectural, but if it is on account of the fine texture and polish, the Kingfishers should also have been made an exception. It would appear, moreover, that Woodpeckers' eggs are accasionally spotted. It is reported that Audubon once found a set of spotted eggs of the Three-toed Woodpecker. Angus Gaines, Viscennes, Ind., noted a set of eggs of the Red-headed Woodpecker with reddish spots at the larger ends (see *Oologist*, Vol. XII, p. 118) and in Vol. VIII, p. 96 of the same paper a set of four eggs of the Flicker, spotted with dull red, is recorded

from Fairbank, Minn.; and J. H. Bowles, Ponkapog, Mass., describes the latter species as sometimes laying eggs minutely spotted with dots of red or black, for the most part easily washed off.

Texture. The shell has a fine smooth surface with a porcelain-like gloss normally. A set of five in my cabinet collected at Avery's Island, La., is quite unusual in having no gloss whatever. Granulations appear upon the larger ends not infrequently, being much more noticeable on a white and polished surface than upon a colored or lusterless specimen. Mr. Jacobs, in describing the abnormally large egg in the Ottawa, Kansas, set, notes a number of dead white granulations scattered over the shell at random, and at one side a decided hump; a large circular patch on the larger end is also dead white, indicating a thin spot in the shell.

Measurements. The average of over 500 eggs, nearly all of which were taken in the United States, is 1.09×.85. 173 eggs taken in New York and Pennsylvania are but a very small fraction above the general average. When amassing data, the extraordinary amount of variation to which it proves subject was not taken into account and what was at first considered a fair number of measurements proves insufficient material for a series of locality averages. The South, Northeast, and Northwest show surprisingly little difference in general averages. Leaving out the series of 48 eggs taken from a single bird inhabiting the mountains of Western North Carolina, reduces the Southern average to 1.06×.84, and a further reduction to 1.02×.83 is made by not including the Louisiana (Avery's Island) series which are large eggs also. On the other hand many eggs from Maine, Iowa, Minnesota and Nebraska are unusually small, thus lowering the averages of their respective localities.

LOCALITY.	NO. EGGS.	AVER.	MAX.	MIN.
South (N. C., S. C., Ga., Fla., La.)	133	1.098 x .849	1.24 x .92	.90 x .75
Northeast (New England, New York, Ontario—Toronto—, Pennsylvania)	233	1.090 x .855	1.15 x .91 1.22 x .86 1.21 x .88	1.00 x .75 .96 x .80 .97 x .73
Northwest (O., Ky., Wis., Kas., Neb., Iowa., Minn.)	126	1.088 x .855	1.41 x .93	.93 x .65

The major axis is subject to much greater variation than

the minor axis, which is I believe, the case with all kinds of eggs.

A set collected at Mt. Pleasant, S. C., April 21st, and now in the collection of Mr. R. P. Sharples, measure 1.17×.89, 1.24×.92, 1.19×.90, 1.10×.84, and the collector—Mr. Arthur T. Wayne—says they might easily be mistaken for the eggs of the Pileated Woodpecker. It remains for the Ottawa, Kansas, bird, already referred to as building in a school house loft, to break the record in the dimensions of one egg. The set is now in the collection of Mr. J. Warren Jacobs and measures 1.16×.94, 1.15×.91, 1.15×.88, 1.17×.94, 1.21×.92, 1.19×.91, 1.41×.93. Equally remarkable is a set of small eggs collected by Prof. Ora W. Knight, Bangor, Maine, June 14, '93—.85×.75, .99×.79, .98×.77, .87×.79, .77×.72—and is probably a second or third set. The average of 16 eggs known to be of the second laying is slightly less than the general average —1.07×.84. Mr. Chas. L. Phillips, who took 71 eggs from one hole in 73 days, states that they appeared of the usual dimensions with very little variation; a fact also noted by J. Parker Norris in the *Ornithologist and Oologist* after he had collected 30 eggs from one pair and found the last egg as large as the first. The measurements of the 48 eggs taken from one bird near Greensboro, N. C., as already briefly mentioned under the head of *Season's Aggregate*, are before me, although unfortunately not in exact order of deposition, and exhibit a great difference in size—from 1.08×.80 to 1.17×.87—much larger than the general average. Runt eggs are by no means scarce, in fact I consider them more often occuring in this species than in any other of the family. Mr. Otto Grady, Ludlow, Ky., found a nest June 24, '95, containing six young ready to leave, piled pellmell on top of one another, and three runt eggs; one being as thick as an ordinary Robin's egg and much longer than the average Flicker's egg, the second the size of a Red-headed Woodpecker's egg, and the third almost globular. An Orleans County (N. Y.) collector took 20 eggs from a pair in 27 days, the 8th and 9th being runts. Another is incidently mentioned by another New York oologist, but no particulars given. There is a distinction between the small fertile eggs such as are given in the locality table, and the

runts which are excluded from all averages; such as I have measurements of appear below:

Toronto, Canada	June 7, '95, in set of 8 eggs,	.70 x .56
Grinnell, Iowa		.67 x .58
Avery's Island, La	May 14, '95, in set of 6 eggs,	.79 x .62
Port Hope, Ontario, Canada	June 10, '98, in set of 4 eggs,	.79 x .65
Philo, Illinois	May 11, '98, in set of 9 eggs,	.83 x .67

In Other Birds' Nests. When the exact circumstance of deposition is unknown, the owner of a nest in an old Woodpecker cavity is the bird placing the lining therein, the chamber being vacant. It is hardly probable that the Flicker would intrude unless its own nest had been destroyed before the completion of its quota. On June 6th, '89, while collecting near Lake Assawamsett in Plymouth County, Mass., Mr. A. C. Bent explored an old orchard. One tree contained a Bluebird's nest with five eggs of the owner and one of the Flicker's, and in a neighboring cavity a deserted nest of a Tree Swallow with the same number of eggs. A not much frequented place and while possibly the work of some boys, it is hardly probable. A similar instance is recorded by E. G. Elliot, Bradford, Mass., May 16th, '84, of a set of five eggs of Bluebird and one of Flicker, nest of grass and feathers. Records of European House Sparrow and Red-headed Woodpecker eggs in freshly excavated quarters with one or more eggs of the Flicker are not uncommon, and upon investigation the latter proved to be the aggrieved party in every instance. In the *Oologist*, Vol. XII, p. 76, Walter Draper, Barahoo, Wis., gives an interesting account of an "Eccentric Flicker." He observed a Mourning Dove's nest in process of construction on a limb of an oak tree near a path, and a few mornings later was surprised to see a female Flicker on the nest. She was not disturbed at that time, but returning at noon to investigate, the Dove was flushed from her own two eggs and a cracked egg of the intrudor found near the edge where it had probably been shoved by the proprietor.

INCUBATION.

Few birds so timid and defenceless as the Flicker, sit so closely and presistently. While occasionally it may be seen to fly from its nest at a near approach, it is usually very hard to drive out; shouting and pounding upon the base of the tree having little effect, and often it is necessary to prod the bird with a stick or reach in and pull her out by the beak. She is gentle and harmless, never offering to claw, bite or strike, although capable of inflicting a painful wound if disposed to use her strong beak. When caught she will struggle violently for a moment or utter a long wailing, despairing shriek which will be answered by the mate if within hearing distance. In one instance described by Mr. Jacobs the female returned and entered the partly destroyed cavity, emerging only to re-enter and re-examine her home the second and third time; and at another time when the female was flushed and set collected after dark, she came quite near and alighted on his back acting as if very much dazed or blinded. Prof. Jones has found it occasionally making fierce dashes at the intruder and also relates an incident of his first experience with it as a close sitter, taking it for an Owl and dropping three large stones upon it in the vain hope of causing it to vacate. When the nest was opened she was found pinned down by the stones but so carefully protecting the eggs that not one was broken, and happily she seemed unharmed also. For a bird habitually nesting in dark situations, it seems strange that it exhibits such a dislike and inaptitude for movement after the sun has set, acting stupidly and deserting the nest for good if disturbed at such a time. Incubation may commence soon after the first egg is deposited, or in accordance with the great majority of birds, after the set is completed. More than 90 per cent. of the sets of which I have data show the latter condition, and curiously enough, all but two instances (Louisiana and Kentucky) of irregularly incubated eggs occur in the New England and

Middle States; from which we may infer that this species, as well as the Cuckoos and Kingfishers, are more addicted to this sort of thing, for which I believe no cause has yet been assigned, in the east than in the west. Most birds incubate by squatting upon their eggs in an upright position. One observer suggests that the Flicker may assume the posture of a Screech Owl while upon the nest, as in every case where he has opened the chamber it has been found lying upon the eggs; but it is more than possible that the parent lay close but momentarily to avoid the falling *debris*, protect the young or eggs, or in the vain hope of escaping notice. Mr. Sinclair has had exceptional opportunities of observing the bird on her nest without disturbing her in the least, in the garret of the school building alluded to under the head of *Position*; the loft being pitch dark excepting the light entering the rough entrance, in front of which the female sat upright like any ordinary bird. I have ample proof that it is doubly monogamous, though the observers with few exceptions have not found the male taking his turn at covering the eggs. It may be a more common trait in the east, where the bird is frequently lifted from a set of eggs well along in incubation. Sometimes near the middle of the day the male appears and utters a few love notes, when he is at once joined by his brooding mate, who soon hurries off in search of food, while the devoted male takes her place on the eggs. On June 12, '97, I was in the vicinity of a nest placed 35 feet up in the dead top of a chestnut tree in the woods, while the change was being effected. Time, 1:45 P. M.; birds on tree; short duet of *wick-a-wick* or breeding song; both flew away, male returning in five minutes, alighting 12 feet below entrance, and after a thorough reconnoitre in which he undoubtedly observed me, ascended almost imperceptibly, halting four times to look about. Silent and very cautious, taking 25 minutes to get within a foot of entrance. Still suspicious and will not enter, but noiselessly flying to a bare limb and dropping from it to a lower and yet lower branch and back to main stem. As I stole softly away from the foot of the tree, unable to remain longer, he peeped shyly around the trunk at me. On May 28, '98, at 12:30 P. M., I took a male from a nest containing 7 eggs, in which incubation varied from commenced to small embryos, the absence of abdominal feathering provin

that it was a regular task. The female was feeding at the opposite side of the grove. Prof. Lynds Jones has one record of the duration of incubation, which was 14 days. Major Bendire gives it as about 15 days in his *Life Histories of North American Birds.* It doubtless varies to some extent, according to locality and season.

YOUNG.

It is hatched both blind and naked, remaining in this helpless and callow condition for over a week. It is not known when the white membranous process which extends from either side of the base of the lower mandible disappears, but it probably goes at a very early age. This formation is apparently peculiar to all young Woodpeckers, as suggested by Frank A. Bates in the *Ornithologist and Oologist*, Vol. XVI., p. 35, but its use is unknown. The young are often piled on top of one another, but soon learn to cling to the side of the cavity and avoid too much crowding. On cold or stormy days one of the old birds covers them at intervals, as well as at night, when extremely young. Nearly every one is familiar with the sounds uttered by the unfledged brood, which has been compared to the hissing of a nest full of snakes; as they grow larger, to the winding of a clock; and finally to the click and clatter of a mowing machine. If the tree or stub in which they are situated is pounded, their combined voices increase to a perfect storm of vociferation. Both sexes feed the young with equal assiduity, and up to the time they leave the nest, by the process of regurgitation only. Nuttall appears to have been the first to discover this peculiarity, but when it was more fully commented upon a few years since by Olive Thorn Miller in *Nesting Time*, William Brewster in *Auk*, Vol. X., p. 231, and J. N. Baskett in *Nidologist*, Vol. II., p. 110, it appeared something in the nature of a revelation. Mr. Baskett kindly furnished me with some data relating to the same nest full of young, from which he took the notes for his article in the above magazine, and is substantially the same. The parents appeared to have different places from which to procure food, and were gone at irregular intervals, rarely both present at once. Nothing was ever visible in their mouths, and the regurgitation, while labored, never seemed to indicate that any large portion was being thrown up. The parent drove its

beak down the gaping and screaming throat of the nestling and began a jerking and riggling motion which seemed to tax the efforts of the youngster to hold on, the process lasting for some seconds and seldom repeated at the same visit. As the adults do not remove the excrement, the bottom of the basket-like nest soon becomes foul, but the young manage to keep clean holding tight to the walls by means of their sharp claws, soon creeping to the entrance to peep out on the great world without or to look and listen for the parents, there to receive the food. Thus a period of from two to over three weeks is passed, after which they emerge to spend the day on the tree trunk or large branches, blinking and sunning themselves in the bright light, returning to the security of the chamber on the approach of a storm, threatened danger or return of night; for after all it is their home nest, snug and safe, and by no means the "black hole of Calcutta" imagined. In a few more days the adults, by means of much beseeching, encouraging and threatening language, persuade one after another to try its wings, and short flights are made from limb to limb and tree to tree amid much excitement and flurry. Prof. Jones says that the ability to fly seems to be an individual characteristic, some being able to do so much earlier than others of the same brood. They depend on the food, small fruit and ants mainly, brought them by the old birds for some time after departing from the home-tree, and are supplied with a small quantity of gravel (grinders) before leaving the nest. Apparently the juvenile makes its first essay to supply its own wants while on the ground, as nearly all June and July specimens were shot from that position. The tongue of the nestling is harmless; just when the barb appears I am unable to say. One bird over a week out of its nest had not developed it. Mr. Baskett says that in the fall the young of a family keep well together.

MOLT AND RENEWAL.

The single annual molt, which is complete, occurs directly after the breeding season in the manner described by Prof. Lynds Jones for this paper: The molt of our common Flicker, as illustrated by four specimens, follows the general law of our smaller land birds, with the differences peculiar to the Pici. In these four specimens there are exhibited some individual peculiarities of no importance except as illustrating the principle stated by Witmer Stone, in his admirable paper on the molting of birds, that there are likely to be individual peculiarities of molt within the species. It is well known that among the Woodpeckers, whose tail is used as a support in clinging to perpendicular surfaces, that the middle pair of tail feathers are the last to be lost, and that they are retained until the next pair has grown to a functional length. Apparently the middle feathers, rather than the outer ones, are retained because they are the strongest and are therefore the best able to sustain the weight of the body unaided by the others. Of the four specimens, two are males and two females. I am unable to decide whether they are birds of the year or old ones. There is no apparent difference in the process of molting of the sexes. In common with most other small land birds, the Flicker first molts the middle row of the abdominal tracts, followed almost immediately by the innermost—the 10th—primary and the outermost greater wing-covert. The 9th primary is next shed, and with it the middle row of the pectoral tracts, the two rows next the middle row of the dorsal tract, the middle of the humeral tract and the lower row of the femoral tract. Next the 8th primary, throat, sides of crown and scattering feathers on the thighs. At this stage the regions of first molt are beginning to show new feathers and the molt of the contour feathers has spread somewhat in all directions. With the 7th primary the next to the middle pair of tail feathers, the whole head except the middle of the crown.

Enough old feathers remain in the crown to form a covering. With the 6th primary the next pair of tail feathers, the outer rows of ventral tracts, middle wing-coverts. With the 5th primary the next to the outer pair of tail feathers, next to the inner secondary, middle of crown. With the 4th primary the outer tail feathers, inner secondary, lower row of lesser wing-coverts, two outer pairs of upper and under tail-coverts. With the 3rd primary the remaining upper and under tail-coverts, outer rows of dorsal tracts. At this point the plumage assumes a smooth, clean appearance, the new feathers almost completely hiding the old ones. With the 2nd primary the middle tail feathers, outer secondary, and inner tertiary drop. With the 1st primary the remaining inner rows of the abdominal tracts and humeral tracts, the remaining lesser wing-coverts, with any other unmolted feathers, are lost, completing the molt. With their renewal the plumage is again complete. The last three primaries—1st, 2nd and 3rd—are molted in rapid succession, the third one being but half grown when the first one breaks its sheath. The slow molt of the tail is characteristic of this order, and is a necessity, as hinted above. As a rule among the small birds the tail feathers are molted practically simultaneously. Almost everywhere over the body some old feathers remain unmolted until the new ones are nearly or quite grown. The old plumage presents a much faded appearance, lacking the marked contrast of the new, and appearing much harsher and coarser, due to the worn tips and edges. At no stage of the molt is there any part of the body entirely bare, nor are the flight feathers molted rapidly enough to hinder flight. During the molt the birds seem to feed largely upon such insects as can be easily caught upon the ground or in the grass, indicating a relatively low state of vital force. As to the time of molt: One of the specimens before me which has the molt fully half complete, was taken on July 5th. Another with the molt complete but with the first primary about two thirds grown, was taken on October 17th. This specimen does not seem to be a bird of the year, the other may be. It is hardly possible that one bird requires all the time from the last week in June to the third week in October to complete the molt and renewal. Probably half that time is amply sufficient.

My series of adult birds relates more to the renewal than to the earlier stages of the molt, and in nearly every particular attest to the correctness of the sequence revealed by Prof. Jones' minute examination. The middle rectrices grow more slowly than the first, second and third primaries, which are shed almost simultaneously and grow rapidly. Three specimens taken on September 26th, two on October 3rd and one October 10th—all at Berwyn, Penna.—show the middle feathers from half grown to almost equal to next pair, while the primaries are complete, although the last sheath has not always disappeared. Of two Georgia specimens taken September 10th, the first shows the 3rd primary three-quarters, the 2nd two-thirds grown and the 1st not shed, central tail-feathers dropped and pin feathers on chin and throat; the other shows the 3rd primary four-fifths, the 2nd and 1st one-half grown, middle pair tail feathers one-half grown, also pin feathers in malar and chin. A June 10th specimen from the same locality, varies in having the outer rectrices one-fourth and four-fifths grown, otherwise apparently complete renewal. This bird must surely have remained unmated or lost its mate early in the season, otherwise it could scarcely have been in so fine a dress at that date. Another peculiar state is represented by a hybrid from Santa Cruz, California, September 3rd, with the 3rd primary one-half, outer secondary three-fourths grown at the same time, next to middle pair of tail feathers molted, malar and forehead just renewed. Apparently the feathers about the head and throat begin to drop early but new feathers develop slowly. The central rectrices are the last important feathers to attain their growth.

The juvenile Flicker molts and renews its entire plumage the first year in common with all Woodpeckers, which are numbered with the few groups among the *Altrices* doing so. It varies little if at all from the adult. Seven Georgia birds but a few weeks at most out of nests, taken between June 28th and July 18th, are in various stages of molt and renewal; the red cap often confined to the forehead. A bird taken July 10th had commenced to molt on nape, malar, breast and rump, the 6th primary almost complete, top of head renewed except forehead, a pair of new feathers of the autumnal dress had appeared on either side of the breast, and all signs of the red

cap had vanished. This bird is in a very ragged condition. I am inclined to ascribe the early disappearance of the red cap to growth and abrasion in a similar manner to the small patches of natal down in which many of the *Alltrices* appear, i. e.: the gray feathers growing beneath on the same stem push the red tips upward where they become dead and brittle, rapidly crumbling away. The forehead does not always show signs of molt and possibly may occasionally remain until the following fall.

In Pennsylvania the renewal is complete by the first of October usually, often a week or so earlier.

FOOD.

From an economic standpoint the supreme test as to the beneficial or injurious nature of a very large number of our birds is adjudged from a knowledge of their food habits, more especially if their value as an article of food or for manufacturing purposes is important. To be wholly beneficial a species must feed upon that which is directly or indirectly injurious and in a manner entailing the least possible damage to that which may be utilized by man. Few birds will be found to meet all of the requirements of so exacting a standard, and if the good overbalance the bad qualities, or even if their habits are of a neutral or doubtful character, they should be protected as far as it is possible to do so. Recent investigations conducted by the United States Agricultural Department warranted the statement that "Judged by the results of stomach examinations of the Downy and Hairy Woodpecker and Flicker, it would be hard to find three other species of our common birds with fewer harmful qualities." The Flicker differs from all other Woodpeckers in being more terrestial. Being equally adept in foraging above or upon the ground, it has a much greater variety of food to select from, consequently waxes fat, is more numerous and covers a greater area than any other member of the family in North America. There is little difference in the nature of its food and feeding habits, north, east, south or west; though of course being somewhat more insectivorous in the warmer climes during the colder months. It is almost completely insectivorous from the latter part of March until well into June. Ants form the staple food however. Professor Beal of the United States Nation Museum, places it at about 75 per cent. of the insect food or 45 per cent. of the whole matter for the year. It is often discovered standing over a colony, catching the ants as they emerge or digging vigorously into the soil with its sharp pickax to unearth them, its bill being almost constantly coated with earth from this

habit. In Michigan it seems to have a preference for the mound-building ants (Purdy). In Georgia there are myriads of small red ants which infest every path and byway in summer and one cannot help noticing their funnel-shaped abodes; upon these ants it wages eternal warfare so that its flesh becomes so thoroughly impregnated with the pungent odor so peculiar to these little insects as to be clearly preceptible when removing the skin. It also preys upon a black ant found under the bark of dead trees, but as they are not so plentiful as the former, they do not predominate as an article of food (Smith). I have the result of an examination of twenty-five stomachs, including seven taken from juveniles, collected in DeKalb County, Georgia, by Mr. Robert Windsor Smith. Every month in the year is represented with the exception of May, August and November. In all but two, quantities of either red or black ants were found, with a fair amount of undetermined fragments of *Coleoptera* in ten, one contained a mole cricket in addition to the ants, another three grubs and a large black ground beetle, while the October bird had eaten its fill of gumberries, the same fruit being found with an assortment of insects in the two September birds. Somewhat to my surprise the January bird had eaten the largest number of insects, its stomach being distended with the 841 ants, fragments of 2 ground beetles and 8 pieces of white gravel (299 small red ants, 492 small winged ants, 40 pupa, 3 mound-building ants, 7 ants—species undetermined). The seven young birds had left the nest, though occasionally fed by adults, and were taken between June 28th and July 18th—five in '98 and two in '99. All contained red ants with the addition of wild cherries in them, and beetles in a fourth. A small quantity of white gravel found in all or nearly all young. The stomach of one taken on July 12th contained several pieces of red gravel, in addition to quite a quantity of the usual white flint, and another that two days later had swallowed a splinter of weather-beaten wood, probably their first attempts to feed themselves. In Iowa it is often seen darting after insects in the manner of Flycatchers. Stomachs examined have invariably contained remains of Carabid and Scarabid beetles, with the skins of Lepidopterus larvæ and numerous ants (Jones).

In Pennsylvania I have found as much as 157 large black

ants, 7 May beetles, and a large green larva in a single stomach. Large grubs, crickets and red ants are commonly found. I think there should be no question regarding the inestimable services rendered in keeping within reasonable limits the numerous varieties of ants. In Indiana it not only devours large quantities of mature insects, but their eggs, larvæ and chrysalides (Gaines). Wilson says it also feeds upon woodlice. Grasshoppers when in season form no inconsiderable portion of its food. In early spring and early fall its manner of feeding on the ground is to collect in small, loose flocks, travelling back and forth along the edges of a wood, around a hillside or in a meadow; silently clearing the group of its insect pests, only flying up when disturbed or satisfied; in this manner often mixing in with the Meadowlarks, and in the West extending well out on the prairies at a considerable distance from timber or trees of any kind.

As a correspondent suggests, birds, like other bipeds, only "scratch for a living" when necessity makes it compulsory. Whether its system demands a change of diet or to put its young in the way of feeding themselves or from sheer laziness, it becomes largely frugivorous from late July to November or until its departure, feeding upon the fruit, as it ripens, of the wild strawberry, raspberry, serviceberry, mulberry, red cherry, dewberry, blackberry, huckleberry, elderberry, pokeberry, black cherry, grape, dogwood, black alder, wild plum, hawberry, gum and hackberry; a perfect profusion and succession of wild fruit; often to the almost entire exclusion of insect life, growing fat upon the pulp diet. It is noted by Mr. Robert Windsor Smith that when the bird is gorged with berries but little gravel is found in its stomach; this also applies to many others of our so-called insectivorous birds. I have known it to eat so largely and continuously of certain small fruits that the stain of the highly colored juices would penetrate and saturate the intestines, abdomen, and even dye the bases of the feathers a rich red or purple; particularly so when pokeberries are indulged in. It is extremely fond of the fruit of this plant, and in this connection I wish to state that Dr. W. E. Rotzell has given some attention to the effects of pokeberries upon birds (*Hahnemannian Monthly*, '91, p. 790). An extract of this fruit has been prescribed for obesity under

the generally accepted theory that it acts as an anti-fat agent, but the result of his examination tends to prove that wild birds which were gorged with the berries were always in good condition and frequently quite fat.

When the gumberries ripen in September and October, the sour gumtree (*Nyssa Sylvatica*) is the centre of attraction, and its fruit the staple food. If the Flicker is fond of other fruits it loves the gumberry. At this period of its existence it is in the very best of condition, and hundreds are annually shot for food and sport, being, as a southern observer says, fully as good eating as Doves. Many a country boy's first game has been this large, handsome and palatable bird while it was gluttonously feeding upon gumberries. Picture if you can a calm, hazy, autumnal sky, a cool, green, swampy meadow in which grows an old gum tree with its deep-green wax-like leaves already turning to scarlet; the boy creeping Indian fashion from bush to bush or along the old worm fence; the slight degree of uncertainty highly magnified makes it all the more fascinating to him. The murderous report of the old musket loaded with a generous and well-rammed charge of coarse black powder and large shot, the whirl of many wings followed immediately by the scream of the wounded, appeals but momentarily to his better nature. Stimulated by excitement he hurriedly gathers the dead, wrings the necks of the wounded, and retires within easy gunshot. In a few minutes the Warblers, Cedarbirds and Thrushes appear, shortly followed by the Robins; the Flickers scattered to the four winds, call from tree to tree, and finally a young male, totally lacking in experience, flies straight for the tree on galloping wings. He sees nothing suspicious, and after a lusty, long-drawn call, which apparently means "all's well," plunges deep into the foliage to greedily partake of the tempting banquet. The bulk now come trooping in, racing with the Blue Jays, and the clatter becomes deafening when "bang" goes the gun, down come several more victims, and again the survivors go scurrying away, only to return as before and repeat the experience, gradually becoming more and more wary, until those that are left become so wild and alert as to defy the gunshot range. Unfortunately this slaughter does not end with the boys, but is often carried on more or less systematically by

the so-called sportsman, but I am happy to say not nearly as frequently as formerly, in this section at least.

Of course the Flicker occasionally tastes of the cultivated fruits and grains, such as the blackberry, cherry and mulberry, and corn in the milk; but so seldom as to call forth no complaint. In Illinois he is far less destructive in this respect than his red-headed relative (Gault). The only serious damage reported comes from Farboro, N. C., where he is quite destructive to the peanut crop while the nut is maturing, congregating in great numbers in the fields and playing havoc, often making half a dozen holes near a vine probing for the soft kernel. During the month of August, however, it resorts in great numbers to corn fields in quest of corn worms (Foxhall). Maynard says it is very fond of over-ripe pears and apples. In the North, as the season wanes, the trees, shrubs, bushes and vines become stripped of their fruit, for the Flicker is not the only bird foraging, and the bulk retire southward, leaving the hardy winter resident, usually an old male, to adapt itself to the existing conditions, be what they may, and becomes everything but carnivorous (Bowles). Almost omnivorous, its maw receives the dried or frozen remnants of the wild fruits already named; also the berries of the red cedar, hawthorn, mountain ash and woodbine; the seeds of the sumac, poison ivory, clover, grass, and various weeds; as well as acorns, beechnuts, corn from shocks, and oats, wheat and rye from stacks; while ants, beetles and larvæ are sought from bark and wood of decayed trees and stumps or gleaned from the bare ground or creek banks. During the winter of '87–'88 a single male took up his quarters in a corn crib near Grinnell, Iowa, and waxed fat on the corn and oats in the bins, but succumbed to a temperature of 20° below zero on the 14th of January (Jones). In Michigan its winter food seems to consist mostly of corn, for where there is a field of corn standing only there the Flicker is found. It also resorts to corn cribs, and probably a few beechnuts and acorns, as well as such insects as can be had are eaten (Purdy). Apparently the Flicker performs the same service in Michigan as the Crow does in eastern Pennsylvania for the slothful farmer, but doubtless less thoroughly. Further south it fares better during the colder season. Near Raleigh, N. C., it feeds upon the waste peanuts

on the ground after the crop has been gathered; also on the berries of holly and cedar (Brimley). According to Baker, specimens from Florida often contain the berries of the cabbage palmetto. The large amount of insect food secured by a Georgia bird in January has been already commented upon.

It is presumed that where a large number of telegraph poles are perforated or honey-combed, it is not always with the intention to nest, but that the motive is most often suggested by the humming of the wires which it probably mistakes for the boring of insects. It must be admitted, however, that this occurs almost wholly in treeless localities like Cape Cod and Nantucket, Mass., and the great plains of the West. It performs a good service in scattering the seeds of many useful plants and trees, not among the least of which is the pokeberry, whose young and tender shoots are so highly esteemed in the culinary art. It doubtless assists in the spread of the poison ivy (*Rhus radicans*) and poison shumac or poison dogwood (*R. vernix*), since it eats the berries in the fall and winter seasons.

ENEMIES.

Its natural enemies are few and rather unimportant in the extent of their depredations, as far as the adults are concerned, confined almost exclusively to the Hawks and Owls. Mr. J. H. Bowles observes that the swift little *Accipiter velox* considers it a great delicacy. I witnessed one instance of its unsuccess, however, while watching a number of Flickers feeding in a meadow. Suddenly a commotion occurred half way up the hillside, exciting the whole community; a young male Sharp-shin had darted to where a pair were feeding. Tumbling over in their haste and terror, they dodged and ran with half-spread wings, uttering despairing shrieks, finally taking flight, hotly pursued by the now confident Sharp-shin until directly overhead, when I gave him the contents of my little 68-caliber collecting gun; he instantly wheeled to the right and made for the woods, but dropped dead before going fifty yards. Mr. J. N. Baskett once found a Sparrow Hawk (*Falco sparverius*) and a Flicker on the ground clutched in a life and death struggle, while dozens of the latter species sat on near-by trees, simply sneezing an alarm or threnody. I am inclined to think they are much less successful when attacking it about the tree trunks on account of its skill in dodging.

Mr. Bowles offers circumstantial evidence in the form of numerous feathers discovered in nesting cavities, of nocturnal visits of the Sreech Owl (*Megascops asio*) which he places among its most dreaded foes. An unique instance of these two birds dwelling together in peace and harmony is furnished by Mr. John Meisky, Columbia, Pa. One day in May—about the 16th— he found a nest of the Flicker in a limb of a chestnut tree, and in the same hole was a Screech Owl. Visiting the place twice subsequently he found both birds present, seemingly contented. Although occupying the same cavity the Owl was not on the eggs.

The eggs and callow young are sometimes destroyed by

Red Squirrels (*Sciurus hudsonicus*) and subspecies, Flying Squirrel (*Pteromys volucella*), Weasel (*Mustela vulgaris*), Mice of various species, Red-headed Woodpecker (*Melanerpes erythrocephalus*), Crows (*Corvus americanus*), (*C. ossifragus*), Jays, (*Cyanocitta cristata*); and probably a few others. Mr. C. L. Rawson, who has had a wide experience in collecting, says that he has never seen snakes in holes in trees, *a la* school books, but mice, Red and Flying Squirrels often.

Mr. A. O. Garrett, Fort Scott, Kans., writes that the Flicker appears to be subject to internal parasites to an unusual degree. In skinning a number he found wire worms in the stomachs of fifteen or twenty; also parasites where noticed on the occipital bone in several cases.

Undoubtedly quite a number succumb to extremely cold weather. Prof. Jones records an instance observed in Iowa. Mr. J. H. Armfield notes it among the birds that suffered during the extremely cold winter. One found dead in a post oak cavity, Feb. 22, '99, at Greensboro, N. C. Harry Gordon White made note of one found dead with its feet frozen to a sheet of ice on the floor of a cavity, many years ago.

Man is its greatest enemy. Protection is needed particularly in the South, where most of the surviving adults, plus their progeny, reside for at least one-third of the year. Dr. M. T. Cleckley, writing from Augusta, Ga., states it is being gradually exterminated by the hunters. Mr. Gustave Kohn says that it is shot during the winter season by most hunters, as it is considered as good eating as Doves. He has seen them in bunches for sale on the streets and in the markets of New Orleans, La. This practice, although common enough in the times of Wilson and Audubon, has long ago ceased in the older Northern States. Mr. Fritz V. Raymond, referring to the town of Ludlow, Ky., writes that it is difficult to study birds whose nests are easily found, as a class of destructive boys scour the country for miles around and kill and plunder for the very love of it, stringing eggs like beads and taking the young birds. Plainly the most intelligent people of America are often too thoughtless and indifferent to instruct their children by precept and example in the common laws and economy of nature. As to the ignorant, next to enlightenment—with which I do not qualify my remarks when

including the vicious—a deep-rooted superstition tending to the protection and preservation of our birds is wanted. For exam-ample, the absurd saying, "The sting of a humming bird results in death," has stayed many a hand itching to examine this living gem. Again, the number of Catbirds slain on the altar of a deep-rooted prejudice cannot be estimated.

Mr. Walter G Savage, Hillsboro, Iowa, says he can note no increase or decrease in the past five years, but there has been a decrease of about 20 per cent. in the last twenty years.

MEASUREMENTS.

oubtless a very large series of skins would show a grad-
ıcrease in size from south-northward in all measurements
ɔt perhaps the bill and feet. In a small series this can be
ıasized only when the mean is obtained from remote local-
The table showing the sexual, individual and geograph-
ariation requires no further comment than that the meas-
ents are in inches and hundredths, and were taken by the
r from the dry skins of adult birds, secured on their
ling grounds. Late fall, winter and early spring speci-
are not included. The measurements of young birds but
ırt time out of their nests follows. It would be well to
here that the first primary which is spurious or rudimen-
measures but a little over two inches in the juvenile, and
than two, usually about one and a half inches in the

			Wing	Tail	Tarsus	Bill: Nostril to Tip	Bill: Depth at Nostril	Bill: Width at Nostril
thern	17 males	Aver.	6.04	4.15	1.07	1.09	.33	.35
l States		Max.	6.30	4.46	1.14	1.14	.36	.40
een 40°		Min.	5.90	4.00	1.01	1.01	.29	.32
3° par-	13 females	Aver.	6.06	4.14	1.06	1.11	.31	.34
s lat.)		Max.	6.27	4.55	1.10	1.23	.35	.37
		Min.	5.75	3.80	1.00	1.02	.28	.31
thern	9 males	Aver.	6.00	4.07	1.07	1.07	.32	.35
lStates		Max.	6.25	4.62	1.10	1.15	.39	.39
een 33°		Min.	5.75	3.87	1.03	1.02	.29	.33
5° par-	14 females	Aver.	6.00	4.01	1.09	1.06	.34	.35
l lat.)		Max.	6.23	4.62	1.12	1.13	.41	.39
		Min.	5.75	3.69	1.05	.98	.29	.32
miles.....		Aver.	5.75	3.66	.95	1.07	.31	.34
		Max.	6.00	4.05	1.08	1.11	.40	.36
		Min.	5.55	3.10	.80	1.01	.22	.31

PLUMAGE.

Individual Variation. I will first attempt the description of a typical spring specimen, collected April 20th, '98, in Chester county, Penn'a. Interscapular region, sepia ; Scapulars, wing coverts and exposed parts of secondaries, hair brown ; and the whole barred with deep brown, almost black. Rump white, upper tail coverts white, marked with black. Tail feathers glossy black above, the basal portion of all but the central shafts, chrome yellow ; under surface wax yellow, tipped with black. Primaries and secondaries above, dark-brown ; under surface with chrome yellow shafts and wax yellow vanes—with the following exceptions : beginning on a line near the base of the first primary and running diagonally to the tip of the first secondary, a deep edging of light chrome yellow extends to the body, and from the same line out to tip of wing an edging of dark-brown, heaviest at the tips, encircles the primaries. Bend of wing pale-yellow, spotted with black. Top of head, sides and back of neck, ashy-gray. Scarlet-vermillion crescent on back of head, and a broad black crescent across the breast. Sides of the head, chin, throat and forebreast, fawn color. Remainder of under parts dull white, with circular spots of black on each feather, becoming cordite on flanks and anal region. Sides and flanks washed with a pale fawn-cinnamon. Bill dead brown-black. Toes and tarsi plumbeous. Iris brownish. Individual variation is very great, particularly in the upper plumage. The back or interscapular region, runs through bistre, sepia, olive and hair brown to drab-grey in different specimens, sepia being the most common ; my only example of drab-gray coming from Georgia, where we are led to expect only the darkest birds. The scapulars, wing-coverts and exposed secondaries are usually a shade lighter, often as light as broccoli-brown ; the bars vary only in width. The top of the head is occasionally washed with umber or tawny, and the nuchal

crescent varies greatly in extent and in color from scarlet to vermilion. The sides of head, chin, throat and forebreast from drab through fawn, ecru-drab to vinaceous-cinnamon. The black breast-patch being a generic character remains fairly constant. The under parts vary in the extent and depth of tone of the pale fawn-cinnamon wash, and the size and shape of the black spots. In four specimens the bend of the wing is apparently immaculate, but the small black spots are discovered beneath the surface. The absence or presence, number and extent of the light edgings on the tips and outer vanes of the primaries, and the tips, edgings and barrings of the rectrices offer a more complicated study, as variation occurs more frequently in these parts, and can be successfully investigated only with unstinted material.

Aside from the black malar stripes or "moustaches" which vary in length and breadth, a usually greater width of nuchal crescent, and an apparently less frequently spotted condition of the tips and outer vanes of the primaries of the male, I can detect no constant differentation of sexes. The pattern of coloration of the fully fledged young is very near the same as the adults, but the spots and bars are usually much broader, giving a coarser and darker effect. The immature female as well as the male resembles the mature male in having black malar stripes, and the female in having a narrower nuchal band and in the extent of primary markings. The wings and tail are of a duller yellow and the feathers of the forehead and crown are usually tipped or mottled with scarlet vermilion, dragon's blood or brick-red, posteriorly fading to a rusty brown or burnt umber over the ashy-grey, which extends almost around the eye in some specimens. The lores are frequently blackish, and one specimen has a dusky supercilliary stripe. The throat is often tinged with ashy, pronounced in one specimen, and occasionally a dull vinaceous-buff. The black breast tract is shaped more like a semi-circle than the crescent of the adult, and the whole body has a fluffy, lustreless appearance.

The color pattern of the tail coverts is subject to much variation at any period of the bird's life, but ordinarily follows a definite line of progression. Chapman, in *Bulletin American Museum Natural History*, Vol. III., p. 314, illustrates the development of the long upper tail coverts in fifteen figures,

beginning with the barred, running through the intermediates to the concentric or longitudinally striated, and terminating with the white-edged black feather. He says: "If we assume that the phases just observed epitomize a transition which is occurring in *auratus*, and if we furthur assume that *auratus* is the most recent offshoot of the Neotropical genus *Colaptes*, we should expect the more southern and older species to exhibit only the earlier stages of a color-pattern which in *auratus* has reached its highest degree of development. Unfortunately very large series of the extra-limital species are wanting; so far as my specimens go, however, they seem to support the theory advanced." The posterior upper tail-coverts of two Georgia specimens in juvenile plumage, now in my collection, are black with minute white spot at tip; a distinct and more primitive pattern than any described above, from which I infer it to be a stage almost outgrown and as seldom met with as the white-edged black feather—its present highest stage of color-pattern development. In the variation or transition of the color-pattern of the spurious rectrices, we have a similar condition due mainly to age. This rudimentary tail feather, present in all the Woodpeckers, lies concealed between the present outer and next to outer tail feathers. I consider it of sufficient importance to illustrate in twelve natural sized figures, showing the progression from the primitive dot to spots, cross-bars, and lastly the white-edged black feather, as something seldom occurring. My series of skins is not large enough to contain all stages; hence the sequence may be faulty and is undoubtedly incomplete. Correlative data is incorporated with the explanations on next page.

Seasonal Variation. There are two distinct phases of coloration, autumnal and vernal, although but a single annual molt. The post-breeding molt and renewal results in a somewhat deeper coloring of the upper plumage from nape to rump, and a pronounced primrose suffusion of the under parts, and occasionally the rump. After a few months of wear there is a gradual fading of the upper plumage and a more pronounced change in the lower parts, the primrose or straw-yellow first disappearing from the flanks and anal region, the middle of the abdomen only occasionally retaining a faint yellowish tint. The breeding season is particularly hard on the feathers of

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this bird. Its cavity-haunting habits gradually wear away the light-colored tips which have more or less obscured the bars and spots until all of the darker markings are fully exposed, resulting in a much heavier and darker appearance.

Geographical Variation. Dr. Allen, in the *Bulletin American Museum Natural History*, Vol. IV., p. 38, says: "It has been suggested that the resident form of South Florida would prove separable as a sub-species from the birds at large further north on the basis of its smaller size and darker colors. The average difference, however, as shown by a large amount of material, proves too slight and too inconstant, in either size or color, to make a separation practicable, as is readily shown by comparison of a considerable number of breeding birds from South Florida with a corresponding series from the Middle States or New England. Specimens nearly as dark occur, however, in New Jersey and Massachusetts, so that the average difference in color between Florida and northern birds is not appreciable. There is a lightening of colors as we approach the Plains. This is very noticeable, even in Minnesota specimens, and still more so in specimens from the Dakotas, Nebraska and Kansas." Since the above was written the separation has been made and the southern form given as resident in the South Atlantic and Gulf Coast region. Comparing my series of skins—twenty-three specimens—collected in DeKalb county, Georgia, with those collected in Chester and Montgomery counties, Pennsylvania, Lorain county, Ohio, and Walworth county, Wisconsin, I fail to find any constant difference in coloration, and defy any one to select the so-called *C. a luteus* from the mixed lot with any degree of certainty, except by means of the labels.

A small spring specimen taken in Bradford county, Florida, has a dull, faded appearance, slightly exceeding in size a breeding male, taken in Cleburne county, Arkansas. Both of these birds should belong to the southern form. It strikes me, however, that the stability of a sub-species must be very uncertain when it requires a painful scrutiny in the best light to determine the best shade effects of the upper plumage or a careful and laborious measurement of width of crossbars, combined with the slight and consistent geographical gradations in size, observable in all species having a wide range.

Abnormal Coloration. Albinism is said to be very rare among the *Picidæ*. Ruthven Deane described the only example that had come under his notice—*B. N. O. C.*, Vol. V., p. 26 —a beautiful specimen, taken near Providence, R. I., in '79, the red nuchal crescent and gold-shafts of the wings and tail being the only normal colors remaining, the rest of the plumage creamy-white. Chas. K. Worthen describes a similar example in the *Osprey*, Vol. I., p. 24, said to have been taken in Lee county, Iowa. It is also cream-white, with the exception of a pink nuchal crescent, and the under parts of the wings a rich yellow. A specimen in the young of the year plumage, taken in New Jersey and now in the Philadelphia Academy of Natural Sciences, closely approaches the albinistic phase, having a general washed-out appearance. One of my Georgia skins, an old male in rich autumnal dress, has a single white feather near the center of the occiput.

Melanism, a yet rarer condition of plumage, is represented by a single case cited by Mr. Deane in the above periodical. Records of the last are extremely unreliable unless the specimens are in hand. In proof of this, witness Mr. J. N. Baskett's experience: His little boy called his attention to a bird on the lawn; it seemed to the eye to be perfectly black, but under the opera glass faint markings characteristic of the Flicker, appeared; the bird's pose, shape and movements already established its identity. As it was Sunday and in town, this apparently remarkable melanistic form could not be shot, and the next day it could not be found. A small boy, however, appeared on the following day with the identical bird, it having been shot by his father while it was engaged in digging holes in the corner of his house. On closer examination its plumage proved grimy and greasy with soot with which it had doubtless came in contact while occupying a used chimney as a resting place. This specimen came from the hands of the taxidermist but slightly darker than normal, he having exceeded his instructions and given it a thorough cleansing.

HYBRIDISM.

In order to introduce the subject a brief synopsis must be given of the suppositions advanced by some of our most eminent ornithologists to account for this interesting condition: Although Baird had apparently solved the question satisfactorily away back in '58, other causes were suggested or assigned from time to time, almost up to the present date. Although suggesting that it might be due to environment or climatic influences, Maynard seemed convinced that it was but the insensible gradation of one to the other, *C. cafer* being but a more highly colored race; Ridgway appeared to have considered it the remnant of a generalized form from which the eastern and western representatives had sprung; an opinion shared by Newton at the present time. Coues was undecided as to whether it was a hybrid or transitional form. Hargitt, though leaning toward the theory of hybridization, suggests that it might be a sign of reversion to a remote ancestral plumage.

While hybridism has appeared the only solution to American ornithologists in recent years, it was not until '92 that seemingly overwhelming proof of the fact was presented by Dr. Allen in a paper entitled *The North American Species of the Genus Colaptes with Special Reference to the Relationship of C. auratus and C. cafer.* He finds a complete blending "along the line of juncture of the two species from Southeastern Texas northward along the western edge of the Plains into British America, and then westward in British America to the Pacific Coast in Southern Alaska." Mixed blood is of quite recent introduction in California, apparently, probably within the last thirty years. It is now quite common, particularly in the central and northern Pacific slope counties. While many are migrants from the north a number are residents or breeders. I have examined males taken in San Bernardino and Santa Cruz—April 27, '83, and Sept. 3, '95—which undoubtedly

belong to the latter class. A beautiful specimen, taken at Palo Alto, Nov. 26, '96, resembles Audubon's *C. ayresi*, with a half concealed red crescent, tipped with grey, and the orange-ochraceous wings and tail of *auratus;* head, throat, fore breast and malar stripes of *cafer;* and intermediate back. Cross-breeding is not confined strictly to the Red-shafted; the North-western form *C. c. saturatior* also blends with the Yellow-shafted, as exhibited in a pair collected at Puyallup, Washington. The male taken April 3, '96, has a small patch of red on either side of the occiput, strongly suggesting an incipient nuchal crescent, several creamy-white feathers contrasting with the vinaceous of the rest of the breast, and the fourth rectrices are yellowish. This is probably a young bird, hatched the previous summer, as quite a few of the feathers in its forehead are red. It is only recently that *auratus* has come in contact with the Gilded Flicker, *C. chrysoides*, if at all. A supposed hybrid is described in the *Osprey*, Vol. III., p. 13, a bird taken in Arizona, showing red on the nape. No instance of the actual pairing and interbreeding of the pure Yellow-shafted with the Red-shafted Flicker has ever been published, but a writer in the *Auk*—Vol. II., p. 284—mentions having witnessed the courting of a true *auratus* and a hybrid in Southeastern Dakota; and Chas. T. Morrison—*O. and O.*, Vol. XIV., p. 146—found the hybrid mated with the *cafer* in the Big Horn range, and secured the eggs and parent birds. Rev. William Osburn writes me that he has been informed that the hybrid mates with *cafer*, nesting and producing young. Comparing and contrasting the plumage of the two species, the pattern of coloration is the same, with the exception of the nape, yet excluding the crescentric breast patch of black, there is a complete dissimilitude in coloration. The prevailing color is yellow on one and red on the other, even to the tint on the rump; and the grey head and brownish throat of one are transposed on the other. Hybrids and mongrels present a bewildering number of regular and irregular combinations. Red in the malar or nape is the first to appear as well as the last to disappear. This color about the head being characteristic of the Woodpecker family, is in line with the Darwinian principle of hybrids, showing a tendency to revert to the ancestral stock.

In the event of the western representatives becoming

absorbed, which, strange as it may seem, is a not impossible happening, it appears to me that it would not be replaced by a richer colored bird, such as the Palo Alto specimen for instance, combined with the more advantageous hardiness and aggressiveness of the eastern and northern bird, as suggested by a recent writer (Rhoads in *Science*, Vol. XX., p. 325), but rather, conforming to the general rule that complete hybrids are seldom fertile, a constant infusion of pure *auratus* blood would cause the *cafer* characteristics to become less and less evident until obliterated entirely. The very close affinity of the North American types in which the divergence in colors is the greatest, tempts me to propound the following question: Is it less than improbable that the original *Colaptes* stock has been dichromatic, the yellow phase evolutionizing into one group of which *auratus* is an example, and the red phase into another group of which *cafer* is a representative and *chrysoides* standing for the intermediate? The Red-shafted is less prone to wander; a few specimens have been taken in Iowa, Nebraska and Kansas. A hitherto unpublished record from Forest City, Winnebago county, Iowa, by J. Eugene Law is the easternmost perfectly authentic record I have seen. Mr. Law assures me that it is an unquestionably pure *cafer*, shot and brought to him by some of his scholars on Sept. 19, '90. The specimens taken in Van Buren county, Iowa, in March, '78, by William Savage, proves to be a well-defined hybrid.

ATAVISM.

It need not necessarily imply that all birds varying slightly from the normal are the result of mixed union, because undoubted mongrels along the line of contact sometimes possess similar characteristics, since Darwin says: "In a breed which has not been crossed, but in which both parents have lost some character which their progenitor possessed, the tendency, whether strong or weak, to produce the lost characters might, for all that we can see to the contrary, be transmitted for any number of generations. When a character which has been lost reappears, the most probable hypothesis is that the character in question has been lying latent, and at last under unknown favorable conditions, is developed." As previously mentioned, there is an occasional specimen, more noticeable in the juvenile, having the crown more or less tipped or washed with brownish or with scarcely more than a suspicion of ash on the throat, colors belonging to the western species, just as truly as the scarlet malar stripe or ruby colored shafts, although not as conspicuous. An anomalous specimen, secured in New York markets and described by Gerrit S. Miller, Jr., in the *Auk*, Vol. XIV., p. 275, is an almost perfect intermediate between *auratus* and the Cuban Flicker *C. chrysocauleus*, and would doubtless be considered a hybrid but for the fact that the breeding ranges of the two species do not overlap. To the best of my knowledge this is the only specimen with spotted rump taken on the North American continent. Possibly the abnormal Gilded Flicker noted under the head of *Hybridism* belongs properly to this section. An old male showing the effects of previous gunshot wounds in wing and mandible, taken in DeKalb county, Georgia, Jan. 27, '99, has a single red feather over the right eye. I shot an adult male near Berwyn, Chester county, Penn'a, Oct. 3, '94, which has a narrow border of scarlet on the upper margin and end of the black moustache; a not at all remarkable condition, occurring

repeatedly in almost every State in which the Flicker is found, and quite as frequently along the Atlantic coast as anywhere. With the exception of the apparent hybrids taken near Toronto, Philadelphia and New Orleans, scarcely a well marked mongrel has been captured east of the Mississippi. The so-called hybrids varying but little from the normal, are often separated by a thousand or more miles from known points of interbreeding, and are surrounded by hundreds of pure birds as far as can be told by the plumage. In view of these facts we may ponder on the probable source of the alien blood. If it is the fading vestiges of an earlier infusion, it should have been much more noticeable twenty years ago, since a hybrid crossed regularly with pure stock would soon have a very small proportion of foreign blood, 1 in 16,384 in fifteen generations for example. Mr. James Newton Baskett is very much inclined to attribute such instances, especially when found on the Atlantic slope, as pure variation, either rudimentary or vestigial, perhaps the latter, since the genus is quite probably of southern origin, and most all southern and southwestern species and races incline to red moustaches; *C. auratus* being a late northward-tending species, showing occasional tendencies to revert. A hypothesis in part or in whole shared by not a few. Dr. W. E. Rotzell also questions the occurrence of hybrids in the East, *C. cafer* not being present; and inclines to the opinion that we must of necessity seek a better understanding; the so-called hybrids may be explained by the fact that there is a strong atavistic tendency in *C. auratus*, the form reverting so frequently in some particulars to the ancestral type, exemplified so frequently in the head of the young.

CONCLUSION.

It is not my purpose to generalize or make further deductions from the evidence collected, but there are some facts and thoughts which appear to me to have not an unimportant bearing on the subject in general. Few species offer greater possibilities and at the same time more difficulties in the way of a close study, than this bird. To deduct the general facts or principles underlying the migration, reproduction, moulting, mode, variation, hybridization, etc., of this one species would in all probability go far toward solving the many vexed problems so important to science and yet so imperfectly understood. The Flicker is both progressive and energetic—a typical American. It may be said to be perfectly fitted or designed to meet the conditions of its environment, but the surroundings are changing, and its habits, food or plumage may alter perceptibly in the not remote future. It doubtless represents a comparatively recent off-shoot of the genus, and is yet undergoing certain modifications of an evolutionary nature. Undoubtedly its comparatively weak curved beak, so like a pick and so unlike the drill-shaped bill of the Woodpecker, would become so less able to withstand the strain of hardwood cutting the less it is used for that purpose, and burrowing in the earth, soft wood and bark become the extent of its capabilities in that line; but it by no means follows that its chiseling power is suffering marked diminution within recent years or the immediate prospect of its curtailment as long as timber is so plentiful. Favorable to the preservation and increase of the species, I may mention an almost perfect protection during the critical breeding time from the inclemency of the weather, and carnivorously inclined beasts, birds and reptiles; great powers of reproduction; abundance of suitable food; hardiness; absence of harmful traits; ease of adaptation to conditions of surroundings; and the possession of the great advantage over nearly all of our Woodpeckers in having a much less con-

spicuous if not mimetic plumage. Its very natural advantages over all other members of the tribe inhabiting the same regions would tend to its preservation, increase and comfort when the less versatile or adaptive species decreased or became extinct under changed conditions; exceptions being made to the Downy (*Dryobates pubescens*), for which there appears a distinctive place, and whose dwarfishness exempts it from persecution by man—Nature's worst enemy.

ERRATA.

Page 3, 6th line from top, for "Anamalium" read Animalium.
" 10, 9th line from top, for "kind" read bird.
" 11, 9th line from bottom, for "kind" read bird.
" 13, 15th and 2nd lines from bottom, omit quotation marks.
" 14, 17th line from top, for "loss" read less.
" 15, 6th line from bottom, under "Average Date When Common" for "April 8" read April 3.
" 19, 6th line from bottom, insert **Autumnal** (to precede paragraph as subtitle).
" 35, last line, for "infloored" read unfloored.
" 38, 15th and 16th lines from bottom, for "Duckwood" read Kirkwood.
" 39, last line, for "Morrel" read Morrell.
" 42, 7th line, for "properties" read proportions,
" 45, 1st line, for "scientific" read intrinsic.
" 47, 11th line from bottom, for "exlcusion" read exclusion.
" 55, 4th line from bottom, for "harmless" read barbless.
" 61, 5th line from top, for "important" read unimportant.
" 62, 12th line from top, for "group" read ground.
" 66, 13th line from top, for "68" read 38.
" 66, 10th line from bottom, for "Sreech" read Screech.
" 72, 16th line from bottom, for "as something" read asymmetry.
" 74, 17th line from bottom, for "twenty-three" read fifty-three.
" 75, 6th line from bottom, for "corner" read cornice.
" 78, 3rd line from bottom, for "specimens" read specimen.
" 82, 1st line, for "natural" read material.

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Address all communications to

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Old Series, Vol. XII. New Series, Vol. VII, No. 3.

THE WILSON BULLETIN.

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No. 32.

AUG 13 1986

Issued Quarterly by the Wilson Ornithological Chapter of the Agassiz Association.

GENERAL NOTES.

EDITED BY LYNDS JONES.

Subscription 50 cents a year.

Oberlin, Ohio, July, 1900.

Entered at the post-office at Oberlin, Ohio, as second-class mail matter.

COPY

An unabridged and unaltered reproduction
of the original issue

THE WILSON ORNITHOLOGICAL SOCIETY

November 1982

KIRTLAND'S WARBLER (*Dendroica kirtlandi*) AT OBERLIN, OHIO.

It has been my rare good fortune to meet face to face three Kirtland's Warblers during the season of migration just past. On May 7 it was seen and heard singing in an orchard of some three acres just outside the limits of Oberlin. The early hour —4:15 A. M.—an overcast sky with fine rain and searching north wind made a satisfactory scrutiny of the bird impossible. Consequently its identity was not fixed. One could not see the markings clearly in the feeble light. May 9th, at 5:00 A. M., in company with a considerable number of students, one was heard singing in the "South Woods" about a mile south of Oberlin. Here, again, circumstances made it impossible to obtain a satisfactory scrutiny of the singer, but the song was carefully studied and written out. On our return from the woods at 6:30, past the orchard mentioned above, the song was heard again and the bird clearly seen and studied for some time. Half an hour later the bird was in my hand for positive identification. It seemed a great pity to sacrifice so sweet a singer for a museum specimen.

One may ask why I speak so confidently of three individuals when but one of them was positively identified. In the first instance it was both seen and heard, and in the second clearly heard, and there is no Warbler song like it. Even the students remarked upon the unusual quality of the song and its striking character. It was given from three to six times in succession at intervals of about fifteen seconds, then with a prolonged pause sometimes lengthening into ten minutes, but often not over two minutes. It is likely, however, that the longer pause was occasioned by the bird flying from one tree to another because of my inquisitiveness. One does not meet so rare a Warbler every day, and so may be excused for a degree of over inquisitiveness. The song was loud and full, given with all the vigor of a Wren or Kinglet; the body being straightened to almost a perpendicular direction, and the beak

pointing straight up. It was no by-talk nor incidental song, but manifestly an earnest and purposeful call song. The song is a double phrased one, the first part slightly longer and a little less rapidly uttered, the second part quickly and more vigorously uttered. I have written it thus: *ter ter ter tee; tswee te chu.* The first three syllables have the *r* trilled slightly and the syllables on the same key, the fourth one about a sixth higher pitched; the first syllable of the second phrase is a third higher than the first three, the second syllable of the second phrase a note above the preceding one and much shorter, while the last syllable is on the same pitch as the first three, slilding a third or more below; it is therefore somewhat prolonged.

– —. It is difficult to represent the song by characters
– – – – but the scheme given may prove suggestive to some.

There are two distinct field characters which appear to me most strongly, which I venture to give. First, because first seen usually, the yellow underparts, from the chin to the tail, without any markings on them except along the sides at the edge of the wings; second, the middle of the bluish gray back with distinct black streaks—four in this specimen. This back pattern is so unusual that to me it was the most striking character. The bird was not at all wary or timid, but allowed an approach within ten feet on both mornings, but in rather heavy foliage.

I claim two records for this rare Warbler, with a probable third. But since the bird captured was in the same orchard as the first one seen, and but two days later, the first and the third may be the same individual. Clearly the one heard singing in the woods could not have gone to the orchard while we were returning, more especially since the natural route of the woods bird would have been at right angles to the direction of this orchard.

LYNDS JONES, *Oberlin, Ohio.*

A DAY IN RUBIO CANYON, CALIFORNIA.

The day dawned brightly as California days are wont to. I had dreamed the night before of "takes" and "finds," and

that day in "Rubio" was a realization. And now as I look back at it in the dizzy retrospect of years it seems like a beautiful dream. Starting from home "Lomita," in the Calmenga Valley near Los Angeles, I met my friend, a true old nobleman of Nature, clad in his rustic garb and carrying a time-worn market basket. But beneath his rough clothes, donned purposely for the trip, there was one of the keenest and best ornithologists of the west. We took the train, and as we passed the country lying from Los Angeles to Pasadena, the scenery was grand. Lemon orchards, palms, little farms here and there as neatly kept as a front yard of a city dwelling, came and went away before the eyes as we peered out of the car windows.

The City of Los Angeles is truly a city of angels to me. And I believe if an angel would drop down from heaven and view around, he would soon soar to that dainty little city cutely ensconced amid a range of the Sierra Madre in southern California, and say, throwing down his mantle and lowering his wings, "I'm back in heaven. I am back in the City of Angels."

We soon reached our getting-off-place and soon started over the rough country of the foothills. Bevies of Valley Quail greeted us along the pathway. A flock of downy young come skampering down the path but a glimpse of us was enough and sent them scurrying away in the high grass nearby. Anna's and Black-chinned Hummers were common, and as we proceeded up the canon, along a little stream, we found many of their nests with eggs. Phainopeplas and Black-tailed Gnatcatchers were common now, and as I passed a little stream I saw for the first time in life a Pileolated Warbler drop down from its green bower, and pausing, drink from the pebbly shallows of the little stream. We found a Black-tailed Gnatcatcher's nest and one of the Western Flycatcher. The former was in a live up-right, far up; the latter amid ferns and other growth beneath the overhanging face of a bank near the stream. Louisiana Tanagers, Black-headed Grosbeaks, Black Phœbes, several kinds of Warblers and California Thrashers were common. I found a beautiful set of the Desert Sparrow Hawk in a cavity of a live oak. It comprised five eggs, the most beautiful I ever saw for this species; I got nearly eaten up by ants

while up after this set. Mosquitoes are not in it when ants are in comparison.

While we were eating lunch a California Condor soared high up above the canon and gave me my first sight of this bird in life. I don't know, in view of circumstances which seem to condemn it to extinction, that I shall ever see it again.

We ascended the canon to its end and spent one of the happiest days of my life in Rubio. The gentle climate and new surroundings were exhilarating and it causes me a refreshing thought whenever I recall that day with M. in Rubio.

JOHN W. DANIEL, JR., *Lynchburg, Va.*

FIVE ACRES OF BIRDLAND.

We had scarcely set foot within the five acre enclosure of the Ahtanum parsonage before I recognized its possibilities as a haunt for birds and determined to register them in the order of their appearance. The parsonage demesne is pleasantly diversified by the presence of a winding stream and plentiful shade. In fact, this five acre plot contains a little bit of every thing. In it are to be found a wheat field, a lowland meadow of wild grass, two alfalfa meadows, an upland pasture with salt grass, rye grass, and sage, a tule' swamp, a rose brush thicket, abundant willows skirting the stream, a fine lawn sprinkled with box elders, maples and young elms, an orchard of thirty trees or so, and a garden. Besides these there are weedy tangles and brush heaps, such as birds delight in ; overgrown fence corners galore ; and best of all, "The Island," a low lying coppice which the creek almost surrounds and above which towers a numerous company of young balm trees.

On the first of June I set out to see how many birds would visit the enclosure within the year, or a given time. In pursuance of this plan the following rulings were established : On my fence is in my yard, and, Over my yard is in my yard. If the desideratum were very near and apparently in need of encouragement I did not scruple to assist nature by making a retreat into the parsonage lot seem more desirable than my approaching presence ; but further than that I did not pass the

bounds: even thus, birds that I thought I had a good right to escaped me. A certain Lark Sparrow would sing his heart out from one of the trees in an adjoining yard but he avoided me as if I were a kodak fiend. An ill favored Turkey Vulture passing up the valley on his daily round of inspection was always careful to give us a considerable berth. Of course we readily excused the omission on sanitary grounds. Many a time did I endeavor to "shoo" a Dusky Horned Lark, nesting in an adjoining back lot, within bounds, but all to no pursose. Finally, at the expiration of four months the bird came of its own accord, and came often, by way of asserting its independence.

Of course we had rare visitors. June 5th was a gala day at the parsonage, for although I mistook the name on the cards, at first, I soon made out *Townsend's Warblers*. The trouble was due to their high plumage. It was brighter, that is "higher," than Coues' description of it. Thus: In the adult male the crown was pure black, not jet black indeed, but still dead black, unstreaked, and most intense on the forehead. Instead of merely "jugulum black" most birds were black *clear up to the bill*, altho—and this is important—some birds were not. This extension of the black throat led me, carelessly enough, to assume *D. occidentalis;* but the other markings are positive and determinative. The bird is an exquisite and no mistake. Not less than a dozen spent the day with us in orchard and shade trees. The birds sang freely. The song was very much like that of *D. virens* in general character, only somewhat lighter and more varied. A returning bird was noted on August 23rd and he was still in song.

Other notables worthy of special mention are: Lutescent Warbler, Black-headed Grosbeak, Least Sandpipers, MacFarlane's Screech Owl and Black-headed Jay. The latter was slipping through the country very quietly, knowing that he was about twenty miles off his beat.

The time covered by the following "yard list" is nine months; for owing to removal from the parsonage in February it is not thought worth while to add those accidentally noted since March 1, 1900. The sixty-three species are recorded in the order of their occurrence.

June 1–4.
1. Rusty Song Sparrow.
2. Western Chipping Sparrow.
3. Yellow Warbler.
4. Pileolated Warbler.
5. Western Yellow-throat.
6. Russet-backed Thrush.
7. Louisiana Tanager.
8. Mourning Dove.
9. Western Robin.
10. Western Meadowlark.
11. Barn Swallow.
12. Western Wood Pewee.
13. Goldfinch.
14. Lazuli Bunting.
15. Brewer's Blackbird.
16. Spotted Sandpiper.
17. Pine Siskin.
18. Wilson's Snipe.
19. Warbling Vireo.
20. Cowbird.
21. Cliff Swallow.
22. Kingfisher.
23. Cassin's Vireo.
24. Kingbird.
25. Western Kingbird.
26. Bullock's Oriole.

June 5.
27. Townsend's Warbler.
28. Lutescent Warbler.
29. Western Vesper Sparrow.

June 7.
30. Burrowing Owl.
31. Killdeer.
32. Red-winged Blackbird.
33. Tree Swallow.

June 8.
34. Cedarbird.
35. Say's Pewee.

June 9.
36. Brewer's Sparrow.

June 10.
37. Western Nighthawk.
38. Crow.

June 14.
39. Hammond's Flycatcher.

June 16.
40. American Magpie.

June 17.
41. Gairdner's Woodpecker.

June 22.
42. Black-headed Grosbeak.

June 26.
43. Red-shafted Flicker.

July 5.
44. Spurred Towhee.

July 8.
45. Oregon Chickadee.

July 24.
46. Bank Swallow.

August 12.
47. Calliope (?) Hummer.

August 22.
48. Red-breasted Nuthatch.

August 26.
49. Least Sandpiper.

August 29.
50. Desert Sparrow Hawk.

September 10.
51. American Pipit.

September 11.
52. Audubon's Warbler.

September 15.
53. Oregon Junco.
54. Inter. Crowned Sparrow.

September 18.
55. Pigeon Hawk.

September 21.
56. Dusky Horned Lark.
September 24.
57. MacFarlane's Screech Owl.
October 1.
58. Ruby-crowned Kinglet.
October 4.
59. Black-headed Jay.
October 15.
60. Western Golden-crowned Kinglet.
November 18.
61. Northern Shrike.
November 24.
62. Redpoll.
February 16, 1900.
63. Green-winged Teal.

REV. W. L. DAWSON, *Ahtanum, Wash.*

MOLTING OF TROCHILUS COLUBRIS.

The molt as evidenced in a series of females of *colubris* offers quite a field for investigation. I have before me twenty examples of *Trochilus colubris*. It has been claimed that no molt is to be observed while the birds are here on their brief summer sojourn with us, but this is only correct in a measure, for certain it is that certain specimens taken in early spring differ widely from those taken later on and into the fall. The change is easily accounted for to an extent, when we remember that these birds perhaps reared their offspring, and in sitting upon their frail structures, protecting their young and their frail homes from the summer storms, very naturally, they more than ordinarily exposed their delicate plumage to wear. But however this may be viewed and giving it its full weight, there is something more than a change, due to these conditions, noticeable in some of the lingering specimens that are taken in the late fall, and attention of working ornithologists should be drawn to it. In this I hope that we may soon have some happy results. The study of the plumage of the juveniles is also interesting, the various stages of it, from the young fellow who is just discovering what his wings are intended for to the final stage of the ruby-throated gallant who flirts around in the sunshine amid the flowers, twittering and whirring his tiny pinions in the balmy air. The extremely young nestlings are no less interesting.

There is not much investigation done along these lines and only a certain class of scientific ornithologists take enough

interest to investigate. But to know a bird well it is necessary to know all about it and the study cannot commence too early in its life history.

The formation of the rubythroat patch commences first in a grayish patch of black or brownish spotted feathers ; these are margined with grayish, which gives the "grayish" aspect or cast to the patch. Then a brilliant patch of ruby will break out on this other patch and finally devour it, as it were, in a brilliant gorget of iridescent fire. The young male does not look unlike the adult female when seen at a short distance. The throat-patch of the male is dead black, when the bird is placed upon its back and a direct downward view taken, while if the bird be laid upon its side, the beauty of the layers of loveliness and sunshine are seen in the bright rufous red or garnet of the throat when the sun strikes it transversely.

Another interesting item is the great variation to be noted in the size of the bills. In the series I am examining there is a very noticeable variation. But to turn back to the question of molt. There is a field for close study, not only in the matter of *colubris* but in all birds, and the tenor of this article is to call attention to rather than point out the importance and the value of such an investigation ; also to seek aid and to request others to help me advance this line of bird study, by contributing notes upon it to our BULLETIN.

JOHN W. DANIELS. JR., *Lynchburg, Va.*,

ANOTHER NEW BIRD FOR LORAIN COUNTY, OHIO.

It gives me pleasure to record two occurrences of the Short-billed Marsh Wren in Lorain County, Ohio. The first was seen by Mr. R. L. Baird in a low place just outside of Oberlin south, the other by the writer one mile west of North Amherst, on the north side of the south lake ridge. Both were singing lustily and were closely approached, but were not captured, our familiarity with the species in other places making that unnecessary. Mr. Baird's record is May 12 and mine May 19.

It is interesting to note, in this connection, that Carolina Wren, which was first seen in the county on September 6,

1899, at Chance Creek, spent two weeks or more in Oberlin village during the latter part of April. Its song was one of the conspicuous ones in the morning chorus during its stay. None have yet been heard at Chance Creek, but I have no doubt that they are nesting there.

LYNDS JONES, *Oberlin, Ohio.*

A CORRECTION.

I learn that it will be necessary to name a substitute for the Alder Flycatcher of the horizon lists of Milton Township, Du-Page County, Illinois, published in No. 28 of this BULLETIN.

Instead of the Alder Flycatcher (*Empidonax traillii alnorum*), it should be Traill's Flycatcher (*Empidonax traillii*).

The nest and four eggs mentioned in the remarks of June 29th were afterwards taken, together with one of the birds, the male, by the writer. The skin was forwarded later to Mr. Walter Deane of Cambridge, Mass., by whose courtesy it was placed in the hands of Mr. William Brewster for comparison. Concerning this Flycatcher, Mr. Deane has written me under date of April 9th, as follows: "Your bird is *E. traillii*. The characters that separate *alnorum* from *traillii*, 'upper parts richer and more olivaceous, the wing bands yellower and bill decidedly smaller', are not borne out in your specimen. Typical *traillii* from further west has a larger bill than your bird, while the bill of your bird is decidedly larger than *alnorum*." Ever since the original naming of *alnorum* by Mr. Brewster, the writer has entertained the idea, erroneous as it seems, that the birds found here during the nesting season were of this eastern form, and it is with pleasure that the present opportunity is now offered for setting matters right.

The foregoing facts also are of interest in showing that this section of Illinois comes some where upon the dividing ridge, or over lapping line, between several eastern and western forms. Interesting examples of these are our House Wrens and Water Thrushes, which prove at times quite puzzling in their proper disposition.

BENJ. T. GAULT, *Glen Ellyn, Illinois.*

ALL DAY WITH THE BIRDS.

The first attempt to determine how many species of birds could be found in a single day in Lorain County, Ohio, was made on May 17, 1898, by Mr. W. L. Dawson and the writer, which resulted in a record of 102 species. May 8, 1899, witnessed the experiment repeated, but on that day Mr. Dawson could not continue the work after 8 A. M. The day's record was 112. There have been two days devoted to this object during 1900; the first on May 5, by Mr. R. L. Baird and the writer, the second on May 19, by the writer alone. The May 5 record is 93, the May 19 record is exactly 100. The smallness of these two records is largely accounted for by the state of the weather. May 5 opened with a temperature of 30° and heavy frost, with a brisk north-east wind blowing; consequently there was not much movement among the birds. The 19th opened at a temperature of 50° with a strong north-east wind and fine penetrating rain for the whole morning, driving the birds to the dense underbrush where the foliage and the dark morning conspired to effectually hide them from view. The early morning work was disappointing in the extreme. The reader will remember that the 1898 and 1899 records were made under some difficulties, especially in the way of wet roads which made the use of wheels impracticable, but on neither occasion was the temperature low, nor was there any appreciable wind. There is probably little likelihood of being able to take advantage of an ideal day for this work, if indeed there should ever be one. However, if the first half of May could be spent entirely with the birds it is more than likely that a more favorable time would be found than any yet taken advantage of. But that is a dream for which there is no likely fulfilment.

A comparison of the species seen on these four occasions proves not a little interesting, especially so as the range of time covers no less than fourteen days in May. If it were possible to give an accurate summary of the weather for the first two weeks or more of May for these three years, this comparison would throw some light upon the influence of the weather upon the several species of late migrents, but that is

a separate topic. The list of species seen on each of the four occasions is of sufficient interest to be given here:

SPECIES COMMON TO ALL THREE YEARS.

Am. Herring Gull.
Common Tern.
Virginia Rail.
Spotted Sandpiper.
Killdeer.
Bob-white.
Mourning Dove.
Red-shouldered Hawk.
Sparrow Hawk.
Belted Kingfisher.
Hairy Woodpecker.
Downy Woodpecker.
Red-headed Woodpecker.
Flicker.
Chimney Swift.
Kingbird.
Crested Flycatcher.
Phœbe.
Prairie Horned Lark.
Blue Jay.
American Crow.
Bobolink.
Cowbird.
Red-winged Blackbird.
Meadowlark.
Orchard Oriole.
Baltimore Oriole.
Bronzed Grackle.
American Goldfinch.
Vesper Sparrow.
Grasshopper Sparrow.
White-crowned Sparrow.
White-throated Sparrow.
Chipping Sparrow.
Field Sparrow.
Song Sparrow.
Towhee.
Cardinal.
Indigo Bunting.
Scarlet Tanager.
Purple Martin.
Cliff Swallow.
Barn Swallow.
Bank Swallow.
Rough-winged Swallow.
Red-eyed Vireo.
Warbling Vireo.
Blue-winged Warbler.
Nashville Warbler.
Tennessee Warbler.
Yellow Warbler.
Black-throated Blue Warbler.
Magnolia Warbler.
Cerulean Warbler.
Oven-bird.
Water-Thrush.
Louisiana Water-Thrush.
Maryland Yellow-throat.
American Redstart.
Catbird.
Brown Thrasher.
House Wren.
Long-billed Marsh Wren.
White-breasted Nuthatch.
Tufted Titmouse.
Chickadee.
Blue-gray Gnatcatcher.
Wood Thrush.
American Robin.
Bluebird.

70(+21+17).

Besides these 70 species seen on each of the four occasions there is a list of 17 species seen on three of the four, and a further list of 21 species which are sufficiently common to make their being seem practically certain under favorable conditions of weather and work. It is evident, therefore, that the county boasts a list of no less than 108 species which one could confidently expect to see during favorable weather in the early part of May. The possibilities which lie within the Warblers are 8 and all other species 16, not including species which may fairly be called rare or casual, and it does not make any provision for the accidents which make the bird student's work so fascinating. The writer does not intend to be boastful for the region in which he finds himself placed. On the contrary this record of what may be found in Lorain County, Ohio, is given in the hope that others in other places may be encouraged to make a similar study of the birds of their region so that instructive comparisons may be possible. The promise of interest and profit which such a study affords is great, and for an inspiration to him who is looking for new things nothing could surpass it.

LYNDS JONES, *Oberlin, Ohio.*

GENERAL NOTES.

THE OLD SQUAW DUCK.—To the average amateur ornithologist the wild-fowl do not seem to present the interest that the smaller birds possess, and the explanation seems to be that they are hard to study on account of the difficulty of near approach and the nature of their habitat. But to some they are far more interesting, especially so if the student has inherited a love for hunting. The bulk of the migrating wild-fowl pass this section in March and April, but one must watch the open waters in February if he would study that most erratic visitor, the Old Squaw. Wheaton gives the Old Squaw the name of being rare in the interior and it is rather uncommon here except in very severe winters, when it occurs frequently. When the ice locks up their food in Lake Erie they are apt to be found in unusual locations. On the 20th of February, 1899,

while beating our way through the willow tangles of the east bottom. One of the three fresh eggs was a Cowbird's.

Rio Grande River, Thornton, N. M., June 30 to July 1.

Spotted Sandpiper,
Killdeer.
Mourning Dove.
Desert Sparrow Hawk.
Burrowing Owl.
California Cuckoo.
Broad-tailed Hummingbird.
Arkansas Kingbird.
Cassin's Kingbird.
Western Wood Pewee.
American Crow.
Desert Horned Lark.
Cowbird.
Red-winged Blackbird.
Western Meadowlark.
Arkansas Goldfinch.
House Finch.
Cassin's Purple Finch.
Western Lark Sparrow.
Black-headed Grosbeak.
Western Blue Grosbeak.
Barn Swallow.
Bank Swallow.
Yellow Warbler.
Long-tailed Chat.
Western Yellow-throat.
Mockingbird
Catbird

July 2nd, on board train.

The only notable species seen during the ride from Thornton to Flagstaff were American Raven and Roadrunner.

A brief comparison of our list of San Francisco Mountain birds with that of Dr. Merriam in North American Fauna, No. 3, pages 87-101, is interesting. It should be borne in mind that Dr. Merriam's work covered all of two months while we were covering the distance from Flagstaff to the summit of the highest peak in one whole day between two half days. We were therefore concerned with resident birds and breeders only. Our bird records were incidental to the mountain scaling. Of the 151 species recorded by Dr. Merriam, a little over 60 were possible for us in this limited time. We recorded but 35 of this number, but found two which do not appear on Dr. Merriam's list, Cowbird and Cassin's Purple Finch. About these two there can be no shade of doubt. Among the 32 unrecorded possibilities there are less than ten probabilities, so that we feel that the cream of the fauna was gathered even in this incidental way. In such vast reaches one needs far more time for study than we could possibly afford.

first, then the lower note, G sharp, came after. The volume was light, and the song seemed feeble, considering the size of the singer. During the past winter, I have seen a greater number of winter visitors than ever before. Red Crossbills and Siskins were abundant during the fall, while Redpolls, Pine Grosbeaks and White-winged Crossbills were common during the winter. To these I must add, for this immediate vicinity, a flock of ten Cedarbirds which wintered here and still remain, feeding on juniper berries, which are plentiful.

NED DEARBORN, *Durham, N. H.*

EDITORIAL.

We are pleased to notice that *The Maine Sportsman* is awakening interest in bird protection among its readers by vigorous editorials upon that subject. As a magazine in the interest of Maine sportsmen, or any sportsmen who desire genuine sport, it is invaluable. Its high standard of excellence is constantly maintained.

In another place there is a call for notes on migration which it is very important that every reader of this paper should heed and comply with. The time covered by this call has never been carefully worked over for any considerable space of country, but it is the time above all others which is worthy of careful attention. Address all letters to Oberlin, Ohio, as heretofore.

It has been necessary to cut this issue down to twenty-four pages instead of twenty-eight, as first planned, due largely to the increse in the number of pages of the two preceding numbers—30 and 31. The time which would normally have been given to the solicitation of copy was largely demanded by the increase of work which fell to the editor's lot on account of sickness in the teaching force of his department.

Bird-Lore continues to sustain its high standard, under the editorship of Mr. Frank M. Chapman, as a magazine which not only champions the cause of the birds from a logical and proper view point, but also continues to encourage the use of the camera in the study of the birds by concretely illustrating

what the camera can accomplish. Every effort of the magazine is bent toward educating its readers into a proper appreciation of the birds.

The editor expects to spend July and August in the mountains of central Washington with Rev. W. L. Dawson, in search of rest, recreation and birds. He hopes that many of the mountain birds will condescend to have their pictures taken so that others may share in the pleasures of the outing. During this absence the business of the BULLETIN will be taken care of by Mrs. Editor, from Oberlin as heretofore. All communications will receive prompt attention.

The two preceding "Special" BULLETINS have crowded out the department of Publications Received, causing a considerable accumulation which it has seemed worth while to give fully in this number. Attention is especially called to Mr. Frank M. Chapman's *Bird Studies with a Camera* as a book which should be in the hands of every one who essays to photograph birds. The book is a picture gallery of birds as they are seen in the full enjoyment of life and liberty.

We are in receipt of the speech of Hon. John F. Lacey of Iowa, in the House of Representatives upon the bill to "prohibit the transportation by interstate commerce of game killed in violation of local laws, and for other purposes." The bill applies to all birds as well as to game. This speech is a masterly defence of the birds from the standpoint of a statesman who knows what he is talking about. Surely the signs are multiplying which indicate a widespread and wholesome interest in bird life. Let the good work go on to the saving of our best friends while yet there is time.

The magazine *Birds* which was the first magazine to introduce the process of color photography into nature study publications, later changing its name to *Birds and All Nature* when other subjects than birds were introduced, now changes its name to more appropriately designate its contents to *Nature and Art*. This does not involve a change of plan in the make-up of the magazine, but we notice that the range of subjects is somewhat broadened and the publishers have secured the services of a number of men as contributors who are well

informed upon the subjects of which they write, rather than trusting to scattered contributions from all sources. This magazine fills a distinct want in the popular literature of the times, and is doing a good work in the education of the people to the proper appreciation of "All Nature."

A most encouraging sign of the deep interest that is being manifested in birds by all classes of people is the demand for courses of Ornithology in colleges and universities. There are at hand circulars announcing a summer school of Ornithology at Princeton, New Jersuy, to be conducted by Mr. W. E. D. Scott, Curator of the Department of Ornithology in Princeton University; and "Bird Study at Wood's Holl Marine Biological Laboratory," under the direction of Dr. Thomas H. Montgomery, Jr., assisted by Drs. Whitman and Herrick and Messrs. Stone, Dearborn and Chapman. These courses will not be such as to require the sacrifice of life of any bird but will be directed toward the study of the living bird in its natural environment in the enjoyment of full liberty. We rejoice in the movement for supplying a real want on the part of these great universities.

It has been impossible to fulfil the promise made last November to issue the BULLETINS for 1900 on time. The editor has fretted over this at least as much as anyone, but he has been powerless to avoid it. But he feels a certain satisfaction in at last seeing in print the results of years of earnest work. The compilation of these reports was completed more than a month before they were due to appear, but from their nature the proof was slow in passing thru our hands. In spite of the most careful scrutiny there must be some typographical errors or some omissions which nothing but an errata page can reach. Accompanying this number will be found slips to be inserted in No. 30 on the pages indicated in the index. We confidently expect (that is, as confidently as our broken promises will permit) that the October number will be mailed in October. At this distance it begins to appear that the title of the October number will have to be changed on account of a lack of material out of which to make a report on Migration, but we can promise something worth reading at any rate.

WANTED.

The editor desires migration notes from every reader of this notice, for the first five days of May, for as many years as possible, but particularly for 1900. These notes should cover records of first seen, of the species that become common, of those last seen during the five days. It is not necessary that these notes should cover several years, nor that they should include a large number of species, to be of value, but only that they should reach the editor not later than the first of September. A consciously fragmentary record will be just as welcome as any. Please give this matter your immediate attention.

LYNDS JONES, *Oberlin, Ohio.*

PUBLICATIONS RECEIVED.

In numbers 1200 and 1201 of the Proceedings of the U. S. National Museum, Vol. XXII, Dr. Charles W. Richmond describes the new species *Dendrornis striatigularis*, from Alta Mira, Mexico; and *Æthopyga anomala*, *Criniger sordidus*, *Turdinulus granti*, all from Lower Siam, collected by Dr. W. L. Abbott in the province of Trong.—L. J.

Catalogue of a Collection of Birds from Madagascar. By Harry C. Oberholser. From the Proceedings of the U. S. National Museum, Vol. XXII, pages 235-248. (No. 1197).

The 110 specimens of which this paper treats are referable to fifty-seven species and thirty-two families. The rare species *Lophotibis cristata* and *Ardeola xanthopoda* are most worthy of attention. The annotations are chiefly on plumage and color pattern.

The systematic arrangement of the paper is like that of Notes on Birds Collected by Doctor W. L. Abbott in Central Asia.—L. J.

California Water Birds. No. IV. Vicinity of Monterey in Autumn by Leverett M. Loomis. With one plate.

The first part of this paper is devoted to a daily calendar of the migrations of the water birds from September 18 to

November 14, 1896, thus bridging the gap between the summer and winter observations previously made. Following this calendar the author proceeds to discuss the general subject of migration as illustrated by the movements studied, and to draw a conclusion: "It is held that bird migration is a habit evolved by education and inheritance which owe their origin and perpetuation to winter with its failure of food." The last six of the forty-five pages are devoted to an annotated list of the forty-two species observed during this series of studies. The paper is printed in large clear type on good paper, and the typography is above reproach.—L. J.

Our Common Birds. By C. F. Hodge, Ph. D.

This is number 2, of the Biology Series of Nature Study Leaflets issued from Clark University. It consists of thirty-five pages and thirteen illustrations. The subject matter of this leaflet is another of the earnest pleas for the preservation of our native birds through the medium of education. The suggestions for introducing the subject of bird study into the school room as well as the out door studies, are admirable. The birds are estimated at their true value, while sentimental exaggeration is absent. The pages are plentifully sprinkled with apt quotations of prose and verse, and frequent direct references to careful investigations by experts, and foot notes add value to the paper. It is a leaflet which teaches of Nature Study in schools would find useful. Prof. C. F. Hodge, Worcester, Mass., is prepared to supply copies at five cents each. —L. J.

Notes on Birds Collected by Doctor W. L. Abbott in Central Asia. By Harry C. Oberholser. From the Proceedings of the U. S. National Museum, Vol. XXII, pages 205-228. (No. 1195).

This collection of 142 specimens, representing sixty-two species and twenty-three families, was collected by Dr. Abbott in Cashmere and Ladak in 1895 and 1897. The annotations give the altitude range of most of the species, with some notes on plumage and habits. We notice that the systematic arrangement departs from that adopted by the American Ornithologist's Union committee, following instead the British system, which appears to us the more logical.—L. J.

Green Heron.	American Crow
Mountain Partridge.	Brewer's Blackbird.
Mourning Dove.	Western Meadowlark.
Turkey Vulture.	House Finch.
Desert Sparrow Hawk.	California Shrike.
Burrowing Owl.	Cliff Swallow

July 15 and 16, aboard train, placed Ruddy Horned Lark and California Jay upon my life list, but otherwise they were uninteresting bird-wise. Perhaps it was on account of the mountain scenery that the birds were not more in evidence. Shasta was my first snow-clad peak. You who have seen the snow peaks need no description of mine. You, for whom that pleasure is an anticipation, could not understand my feelings if it were possible to describe them. The only proper thing to do, in the presence of that giant, seemed to be to get up there on his highest pinnacle.

Anderson, Cal., to Glendale, Ore., July 15; and Albany to Portland, Ore., July 16.

Mountain Partridge.	American Crow.
Mourning Dove.	Red-winged Blackbird.
Desert Sparrow Hawk.	Brewer's Blackbird.
Belted Kingfisher.	Western Meadowlark.
California Woodpecker.	Heeman's Song Sparrow.
Arkansas Kingbird.	Western Chipping Sparrow.
Ruddy Horned Lark.	Western Martin.
California Jay.	Cliff Swallow.
American Raven.	Violet Green Swallow.

At Portland, Ore., on July 16, there was time between trains to climb the hill west of the city where Streaked Horned Lark, Gambel's Sparrow and Russet-backed Thrush were added to the list. It was on this height that the lifting clouds revealed the icy cap of St. Helens. It was not until the Columbia river was behind us that I even suspected the presence of other snow-clad peaks, because not until now did the clouds break away. I feel certain of being forgiven for the break in the bird record after Adams and Ranier joined St. Helens to form as matchless a company of snow clads as anywhere graces a landscape. As we wound around now toward

author has confused the Northern Shrike with the smaller summer form. The Northern being the winter bird and the Loggerhead (or Migrant?) the summer form. It is no less unfortunate that he seems to favor the egg collecting mania which attacks every boy; better to discourage such practices. But in his discussion of the Orioles the author has turned to the other extreme by not a little overdrawing the picture for the the average case when the male of a pair has been killed. We turn eagerly to the "Remedy for the Sparrow Plague" in the hope of at last solving the problem of the Sparrow. The author is undoubtedly right in his statement that the only sure remedy is to find some bird which will prey upon the Sparrow, but the difficulty will be to find one that is sufficiently numerous to make any impression. The author thinks that the "Great Northern Shrike" is the bird. The first difficulty with the selection of this bird is that he already has the name of being an indiscriminate butcher. Education may eliminate this difficulty. The second and more serious difficulty is the small numbers of the Shrikes as a group and the fact that they do not, and probably can never be induced to build in cities nor sufficienty near to them to be of any use there. But we can encourage the increase of all small birds of prey and to cease prosecute them in the hope that they will in time become bold enough to prey upon the Sparrows wherever they may be found. The pamphlet is neatly gotten up, printed on good paper and the typography is almost faultless. A half tone of the author as a frontispiece adds to the interest of the paper. —L. J.

*Chapman's Bird Studies With a Camera.**

It is seldom that a book has been so opportunely placed before the public. The study of birds with a camera is the youngest child of Ornithology, but already it gives abundant promise of a development which can accomplish nothing less than a complete revolution of a world-wild attitude toward the birds. The author of this little book has spared neither time

*Bird Studies | With a Camera | with introductory chapters | on the outfit and methods | of the bird photographer | By Frank M. Chapman | Assistant Curator of Vertebrate Zoology in the American Museum of Natural History, and author of Handbook of the Birds of Eastern North America, Bird-Life, etc. | with over one hundred photographs from nature by the author. | New York. | D. Appleton and Company, | 1900. | $1.75.

nor study to the development of this new method of bird studies, and is therefore able to anticipate the needs of bird students who would use the camera if they but knew how to begin.

After an introduction in which bird photography is described as "the use of the camera as an aid in depicting the life histories of birds," some unanswerable arguments upon "the scientific value of bird photography," and "the charm of bird photography" contrasted with the sportsman's apparent pleasure in killing the birds, the author gives a careful and clear statement of what the bird photographer's outfit should consist of and the methods he should employ to attain the greatest degree of success. "The camera—The lens—The shutter—The tripod—Plates—Blinds—Sundries," are all discussed from the standpoint of one who has had large experience not as a professional photographer but as a bird photographer. The discussion of methods covers "Haunts—Seasons—Nests and eggs—Young birds—Adult birds," from large experience with the camera.

After discussing the outfit and methods, the author proceeds to illustrate concretely in ten chapters what can be accomplished in bird studies in all sorts of situations and under all sorts of circumstances. The 110 illustrations, frontispiece, tailpiece and twelve initial illustrations are all the work of the camera and are a picture gallery of more than usual interest not to say an education in phases of bird life.

The table of contents will better illustrate the wideness of the field covered in the text than could be done otherwise. "Bird photography begins at home, The Chickadee—a study in black and white, The Least Bittern and some other reed inhabitants, Two Herons, Where Swallows roost, Two days with the Terns, Perce and Bonaventure, The Magdalens, Bird Rock, Life on Pelican Island, with some speculations on the origin of bird migration." The 214 pages of text are full of information both photographic and ornithologic. The book should be in every library where it is desired to create interest in the birds among the children as well as among older persons. The book is written in Mr. Chapman's clear and pleasing style, the type is large and clear-cut, the paper heavy enamel upon which the illustrations show sharp details, and the typography is

almost perfect. The book is a distinct addition to ornithology and a much needed guide to the art of bird photography.—L. J.

Proceedings of the Nebraska Ornithologists' Union.

In the distribution of this collection of papers the Nebraska Ornithologists' Union has vindicated its right to exist. Its members are not content to stop with a complete list of the birds of their state, but are engaged in the study of habits and characteristics. Their object is to advance our knowledge of birds along all lines.

In the President's Address, "Ornithology in Nebraska," Prof. Lawrence Bruner makes a strong plea for the protection of the birds by the sure method of introducing bird studies into the public schools of the state. There follow four papers which partake of the nature of local lists with annotations. The first, "A Tweny-three Years' Record Kept by Dr. A. L. Child of Plattsmouth, Neb.," by Dr. R. H. Wolcott; "Additional Notes and Observation on the Birds of Northern Nebraska," by Rev. J. M. Bates; "The Bird Fauna of the Salt Basin, Near Lincoln," by Mr. J. S. Hunter; "Some Bird Notes from the Upper Elkhorn," by Mr. Merritt Cary. "Some Notes on the Nesting of the Raptores of Otoe County, Nebraska," by Mr. M. A. Carriker, Jr., treats of the ten species which are known to the author to breed in the state. "How to Popularize Ornithology," by Mr. Wilson Tout, is discussed from the standpoint of a teacher, urging the importance of education as a means of saving the birds from wanton destruction and of bringing before the people the debt we owe to the birds. In making "A Plea for the English Sparrow," Mr. Lawrence Skow, a native of Denmark, endeavors to show that the Sparrow has a distinct right to life and unlimited increase. Not many Americans will agree with Mr. Skow on this point. The last paper, "Suggestions as to an Accurate and Uniform Method of Recording Observations," by R. H. Wolcott, will be read with much interest by all field students of the birds. The author would give absolute values to the terms commonly used—abundant, common, etc.—thus securing absolute uniformity in observations from all field workers. It is a step in the right direction. Such a scheme, however, while a boon to the earnest bird student, would scarcely be

tolerated by the casual observer who wished to get the most enjoyment with the least effort from bird study. But we are not concerned about that class of people. It seems to us that a species cannot well be more than abundant, and that therefore the qualifying adjective "very" might well be omitted. Before any such scheme can be put into practical use it needs to be carefully tested by a series of field studies by two persons working side by side, the one counting the birds and tabulating the results according to this scheme, the other taking notes upon the general impression made by the numbers, but counting the individuals seen to be avoided. That is to say, the scheme should be, as far as possible, shorn of its arbitrariness by making it as natural as possible. The result would probably be that different values would be given to the large birds than to the small ones. Thus, five Bald Eagles to the mile would be abundant, while that number of Vesper Sparrows to the mile would be only common. Dr. Wolcott is to be highly commended for his efforts to bring about uniformity in the field work of ornithologists.—L. J.

American Monthly Microscopical Journal. Vol. XXI, Nos. 2, 4, 5.

Bird-Lore. Vol. II, Nos. 1, 2, 3.

Birds and All Nature. Vol. IV, No. 5; Vol. VII, Nos. 1, 2, 4, 5.

Bittern, The. Vol. I, No. 1.

Book Reviews. Vol. VII, No. 10; Vol. VIII, Nos. 1, 2, 3, 4, 5, 6.

Bulletin 109. Ohio Agricultural Experiment Station.

Bulletin 47–50. Pennsylvania State College Agricultural Experiment Station.

Bulletin of the Wisconsin Natural History Society. Vol. I (new series), Nos. 1, 2.

Condor, The. Vol. II, Nos. 1, 2, 3.

Cornell Nature Study Quarterly. Nos. 2, 3.

Entomological Student, The. Vol. I, No. 1.

Farm Student's Review. Vol. V, No. 1.

Fern Bulletin, The. Vol. VIII, Nos. 1, 2.

Hummer, The: Vol. I, Nos. 8, 9.

Journal of Applied Microscopy. Vol. III, Nos. 1, 2.

Journal of the Elisha Mitchell Scientific Society. 1890. 16th year. Part 2.

Journal of the Maine Ornithological Society, The. Vol. II, Nos. 1, 2.

Legislation for the Protection of Birds other than Game Birds. By T. S. Palmer. Bulletin No. 12, U. S. Department of Agriculture.

Maine Sportsman, The. Vol. VII, Nos. 76–82.

Museum, The. Vol. VI, Nos. 2–5.

Naturalist's Farm and Fancier's Review, The. Vol. II, Nos. 3, 4.

Nature and Art. Vol. VIII, No. 1.

North America Fauna. No. 17. Revision of American Voles of the genus *Microtus*. By Vernon Bailey.

Notes on Rhode Island Ornithology. Vol. I, No. 1.

Plant World, The. Vol. III, No. 5.

Seventeenth Annual Report of the Board of Trustees of the Public Museum of the City of Milwaukee.

Sportsman's Magazine. Vol. IV, Nos. 1–4.

Western Ornithologist, The. Vol. V, No. 1.

Belted Kingfisher.
Harris's Woodpecker.
Northwest Flicker.
Vaux's Swift.
Olive-sided Flycatcher.
Western Flycatcher.
Hammond's Flycatcher.
Traill's Flycatcher.
Steller's Jay.
American Raven.
Oregon Towhee.
Black-headed Grosbeak.
Barn Swallow.
Bank Swallow.
Violet Green Swallow.
Warbling Vireo.
Audubon's Warbler.
Slender-billed Nuthatch.
Oregon Chickadee.
Russet-backed Thrush.

An afternoon, night and morning, spent between Mount Vernon and Burlington, proved fruitful in species. It was here that Vigor's Wren mocked our efforts to make his acquaintance. The elusive Pileated Woodpecker gave us the merest glimpse, but Lewis's Woodpecker was very much in evidence. Steller's Jay was everywhere, and even more talkative than his eastern cousin. Oregon Junco, Oregon Towhee, Oregon Chickadee, seemed to feel a community of interest.

Burlington, Wash., Aug. 2 3.

California Partridge.
Band-tailed Pigeon.
Desert Sparrow Hawk.
American Osprey.
Belted Kingfisher.
Harris's Woodpecker.
Pileated Woodpecker.
Lewis's Woodpecker.
Northwest Flicker.
Vaux's Swift.
Olive-sided Flycatcher.
Western Flycatcher.
Traill's Flycatcher.
Hammond's Flycatcher.
Steller's Jay.
American Raven.
Northwest Crow.
Bullock's Oriole.
Western Meadowlark.
Brewer's Blackbird.
American Crossbill.
Cassin's Purple Finch.
Oregon Junco.
Gambel's Sparrow.
Rusty Song Sparrow.
Oregon Towhee.
Black-headed Grosbeak.
Lazuli Finch.
Louisiana Tanager.
Barn Swallow.
Violet Green Swallow.
Tree Swallow.
Bank Swallow.
Yellow Warbler.
Western Yellow-throat.
Western Winter Wren.
Vigor's Wren.
Oregon Chickadee.
Western Golden-crowned Kinglet.
Russet-backed Thrush.
Varied Thrush.
Western Robin.
Western Bluebird.

On the homeward stretch we were too much excited over the prospect of seeing familiar faces once more to notice birds.

A chance glance from the window caught a Turkey Vulture on the wing—a rarity here. At Whatcom gulls swarmed over the bay.

The four days spent at Blaine were not wholly given to bird study, yet some effort was made to make a fairly accurate survey of the species to be found at this time of year. One half day was given to the Canadian shore line, when the Loon, Marbled Murrelet and Pigeon Guillemot were added to the list. One half day on the waters of the bay, and another baking clams on the sand spit, clinched our records of the three gulls, the two Scoters and Old-Squaw, and added five sandpipers and the Black Brant. It seemed a wonder that so many commonly supposed northern birds should be here. The boating trip proved that they were wounded birds, unable to accomplish the long northward journey. They haunted the long rafts with gulls, terns and sandpipers, and clumsily waddled into the water upon the approach of danger. Bonaparte's Gull, by far the commonest bird about the bay, constantly hovered about the salmon canning plants and the reducing plant during the day, and many roosted under them and under the walks from shore to buildings, during the night. At low tide gulls and sandpipers followed the waters to and fro over the mud and sand flats, feeding upon whatever might be stranded, but during high tide the larger gulls, with most of the smaller ones and ducks and sandpipers, waited patiently on the rafts, for the turn of the tide. They literally covered these small rafts, and rose from them, on our approach, in a cloud.

Blaine, Washington. Aug. 4–8.

Loon.
Marbled Murrelet.
Pigeon Guillemot.
Western Gull.
California Gull
Bonaparte's Gull.
Common Tern.
Old-Squaw.
White-winged Scoter.
Surf Scoter
Black Brant.
Great Blue Heron.
Baird's Sandpiper.
Western Flycatcher.
Hammond's Flycatcher.
Northwest Crow.
Western Meadowlark.
Cassin's Finch.
Pine Siskin.
Gambel's Sparrow.
Western Chipping Sparrow.
Sooty Song Sparrow.
Oregon Towhee.
Black-headed Grosbeak.
Lazuli Finch.
Cliff Swallow.

Semipalmated Sandpiper.
Western Sandpiper.
Western Solitary Sandpiper.
Spotted Sandpiper.
Band-tailed Pigeon.
American Osprey.
Desert Sparrow Hawk.
Belted Kingfisher.
Lewis's Woodpecker.
Northwest Flicker.
Western Nighthawk.
Black Swift.
Vaux's Swift.
Allen's Hummingbird.
Barn Swallow.
Tree Swallow.
Bank Swallow.
Rough-winged Swallow.
Cassin's Vireo.
Cedar Waxwing.
Yellow Warbler.
Audubon's Warbler.
Parkman's Wren.
Vigor's Wren.
Oregon Chickadee.
Russet-backed Thrush.
Western Robin.
Western Bluebird.

The lonely homeward journey began when the boat swung free of the wharf at Blaine, at about three o'clock in the afternoon of August 20. If we could believe that every parting was but the promise of another meeting we should avoid a great deal of sadness.

Beyond the long slender sand spit, beyond the forest of salmon nets, everywhere, even into the fading twilight, swarmed the gulls and scoters, while an occasional flock of sandpipers scurried across our bows. The white caps of the distant Olympics threw back the rays of the setting sun. Surely the setting of these Thousand Isles of the Pacific cannot be rivalled in any land. The islands themselves are diversified beauty and grandeur, still possessing, in large measure, their primitive characters.

Morning dawned upon a birdless waste of water, but by full day the gulls had awakened and ducks had come out of their hiding places. But these do not appear in the day's horizon. Only those are entered which could be seen from the wharf after arrangements had been completed for the overland journey. Only the gulls ventured near enough to the wharf to be seen clearly.

It was an interesting and varied landscape that passed in review during the day's ride from Seattle to Pasco—from tide water, over the most humid stretch of country in the land, up and over the Cascade range, down the course of the Yakima River to and across the Columbia. Naturally the bird life was varied, yet scarcely equalling the topography in that respect. Nothing new appeared until we were racing down the east side

of the Cascades, when a short stop near Ellensburg gave the opportunity to see satisfactorily the Mountain Song Sparrow. Further along, beyond Dawson's late parish—Ahtanum—in the sage brush region of Toppenish, I was made glad by the sight of a flock or small company of Sage Grouse as they clumsily made way for the train. Many times during the remainder of the day, as well as on the following day, the Sage Grouse left the track on the approach of the train. The The Dusky Horned Lark was the last addition to my life list for the day, as we approached the Columbia River.

Seattle to Pasco, Wash. Aug. 10.

California Gull.
Western Gull.
Bonaparte's Gull.
American Coot.
Spotted Sandpiper.
Killdeer.
Sage Grouse.
California Partridge.
Mourning Dove.
Turkey Vulture.
Swainson's Hawk.
Prairie Falcon.
Richardson's Merlin.
Desert Sparrow Hawk.
Belted Kingfisher.
Lewis's Woodpecker.
Northwest Flicker.
Western Nighthawk.
Kingbird.
Arkansas Kingbird.
Streaked Horned Lark.
Dusky Horned Lark.
American Magpie.
American Raven.
American Crow.
Northwest Crow.
Western Meadowlark.
Brewer's Blackbird.
Cassin's Purple Finch.
Mountain Song Sparrow.
Sooty Song Sparrow.
Oregon Towhee.
Barn Swallow.
Bank Swallow.
White-rumped Shrike.
Oregon Chickadee.
Western Robin.
Western Bluebird.

Daylight left us creeping over the sage brush plains and hills of south-eastern Washington, but found us again safely in Montana, hemmed into the valley of the North Fork of the Columbia. This was August 11, a day with many pleasant surprises. The first surprise came while we were toiling up a sharp grade at a slow walk. On a small pond beside the track a flock of Cinnamon Teal sat undisturbed while we passed. Not far beyond a smaller flock took wing and went to join the others. Along the bottoms of the Flathead River Western Vesper Sparrows were playing the same antics I have so often seen in their eastern relatives. At Missoula Bobolinks took

me wholly by surprise. Nor was I prepared to see so many White-winged Scoters on the head waters of the Missouri. Just before we reached Bozeman, during a gentle shower, Arctic Towhee came into view, and in a field just beyond the outskirts of the city a family of Columbian Sharp-tailed Grouse skurried away under the fence. Thus ended the second day ornithologically, but not meteorologically. During the day there had been an ever increasing indication of trouble ahead, but nothing definite could be learned. The rumors of a great washout on the Yellowstone beyond Billings began to die out as darkness settled down upon the walled valley of this great river. Near midnight our dreams of the green fields of the old home were rudely dispelled by the summons to leave the train. A few moments later the intelligence that no trains would leave Billings for three days came rather startlingly, but even midnight wayfarers can find where to lay their heads. There had been a great cloud-burst in the Yellowstone valley which left broken embankments and ruined bridges in its wake.

Thompson's Falls to Livingston, Mont. Aug. 11.

Cinnamon Teal.
White-winged Scoter.
Great Blue Heron.
Spotted Sandpiper.
Killdeer.
Columbian Sharp-tailed Grouse.
Mourning Dove.
Marsh Hawk,
Sharp-shinned Hawk.
Swainson's Hawk.
Ferruginous Rough-leg.
Desert Sparrow Hawk.
American Osprey.
Belted Kingfisher.
Lewis's Woodpecker.
Red-shafted Flicker.
Western Nighthawk.
Kingbird.
Arkansas Kingbird.
Say's Phœbe.
Desert Horned Lark.
American Magpie.
American Crow.
Bobolink.
Brewer's Blackbird.
Pine Siskin.
Western Vesper Sparrow.
Western Lark Sparrow.
Mountain Song Sparrow.
Arctic Towhee.
Green-tailed Towhee.
Black-headed Grosbeak.
Barn Swallow.
Bank Swallow.
Yellow Warbler.
Western Robin.
Mountain Bluebird.

Serious as delay at first appeared, it proved a boon in reality, for the opportunity to study the birds of the region was a rare one. Among the thirty-seven species recorded two were new to my life list and ten were new to the trip.

Billings lies near the middle of a broad valley made fertile by irrigation. On three sides the Bad Lands rise abruptly two or three hundred feet like a fortification wall. The river washes the talus from the east and south wall, crossing the narrowed mouth of the valley below the city.

Eastward toward the river, in the fenced cattle ranches, the sage brush and the weeds which grow along the irrigation ditches afforded shelter for innumerable sparrows, while the alkali ponds occupying old river beds fairly swarmed with waders and both Blue and Green-winged Teal. The old birds flew from me and circled as long as I remained in the vicinity, but the young and many of the females lost themselves completely in the thick growth of rushes. It was at one of these sinks that a Grinnell's Water-Thrush startled and electrified me by perching on a stump not four feet away, scolding vociferously. I had started out to climb the higher eastern cliff, but the river turned me back to the northern one. In crossing a sheep ranch one could not help noticing the entire lack of birds due to the fact that the sheep had cropped the herbage of every sort except the cactus, to the ground. There was no refuge for the birds.

The talus of this north cliff has accumulated to the depth of nearly a hundred feet from the level of the valley, and a convenient crack in the wall of soft stand-stone helped me the rest of the way to the upper level. The sand-stone is capped by a relatively thin stratum of poorly cemented conglomerate. The few stunted trees which cling to the edge of this sandstone bluff add picturesqueness to the scene. Here it was that a troop of Woodhouse's Jays paid me a visit. They worked vigorously among the cones in the tree-tops for a few minutes, then passed nervously on down the valley. Here the Rock Wren alternately scolded me in true wren fashion and sang for me when I stood still. In the wind caves and beneath overhanging rocks Cliff Swallows had hung their bottle nests. White-throated Swifts vied with each other in cutting the air into sections about my head, but I could find none of their nests. At the foot of the bluff Arkansas Kingbirds patrolled rocks and bushes, while farther out on the level valley Kingbirds replaced them. Among the outlying houses Robins and Bluebirds were feeding and singing.

Early on the morning of August 13 the Western Meadowlarks were in full song, making a chorus with Robins, Western Lark Sparrows and Desert Horned Larks. A flock of Pipits passed overhead. But we can not stop to call all by name. The list which follows will do that. What most impresses one who is familiar with the eastern regions is the almost lack of birds anywhere out of the valley or at a distance from water. Under such conditions it is far easier to find the birds than where we must look for them everywhere. With an 8-power Bausch and Lomb one can almost sweep the breadth of the valley from the bluff top.

At about 9 o'clock some good angel suggested the possibility of a train leaving during the morning. Sure enough, there was barely time to pack and get back before time to start. But once aboard the train there seemed to be no hurry! We did finally start some time after 11 o'clock.

Billings, Mont. Aug. 12–13.

Green-winged Teal.
Blue-winged Teal.
Lesser Yellow-legs.
Semipalmated Sandpiper.
Spotted Sandpiper.
Killdeer.
Mourning Dove.
Marsh Hawk.
Ferruginous Rough-leg.
Desert Sparrow Hawk.
Red-shafted Flicker,
Western Nighthawk.
White-throated Swift.
Kingbird.
Arkansas Kingbird.
Say's Phœbe.,
Western Wood Pewee.
Desert Horned Lark.
Woodhouse's Jay.
Western Meadowlark.
Pine Siskin.
American Goldfinch.
Western Savanna Sparrow.
Leconte's Sparrow.
Western Lark Sparrow.
Clay-colored Sparrow.
Western Field Sparrow.
Arctic Towhee.
Barn Swallow.
Yellow Warbler.
Grinnell's Water-Thrush.
American Pipit
Rock Wren.
Western Robin.
Mountain Bluebird.

Progress was slow. During the afternoon frequent and considerable stops had to be made, both on account of the soft embankments and on account of a heavier train which had started some hours in advance. The cloud, in bursting, had emptied more water close to the south bluff than could find its way into the natural channels, so it rushed straight on to the railroad embankment and tunneled it in a hundred places with-

out actually displacing the track, except that whole bridges were gone from the larger streams. If the stops had been made between stations the bird list would have been larger. As it was Krider's Hawk and Prairie Sharp-tailed Grouse exhibited themselves conspicuously.

Billings to Miles City, Mont. Aug. 13.

Great Blue Heron.
Greater Yellow-legs.
Yellowlegs.
Western Solitary Sandpiper.
Spotted Sandpiper.
Prairie Sharp-tailed Grouse.
Swainson's Hawk.
Krider's Hawk.
Desert Sparrow Hawk.
American Osprey.
Belted Kingfisher.
Red-headed Woodpecker.
Red-shafted Flicker.
Western Nighthawk.
White-throated Swift.
Kingbird.
Arkansas Kingbird.
Western Meadowlark.
Bullock's Oriole.
Brewer's Blackbird.
American Goldfinch.
Western Vesper Sparrow.
Western Lark Sparrow.
Barn Swallow.
Tree Swallow.
Bank Swallow.
Yellow Warbler.
Catbird.
Brown Thrasher.
Chickadee.
Western Robin.

The morning of the 14th found us racing over the plains of western North Dakota, crossing river valleys and so getting a better impression of the whole country. Bad Land conditions were giving place to the long rolling swells of the vast prairie region, but still inadequately watered. Gradually water became more abundant, gathered into ponds and small lakes held between the hills. Here waders and swimmers swarmed. The sight of the packs of sandpipers resting on the water or at its edge, of ducks in masses, made my fingers tingle, for the species could not even be guessed at. But there was no stopping here. We fairly flew after the smoking spot far ahead untl it began to lengthen, and as it careened around a curve, the cars might be counted. Then our speed slackened, and once we were obliged to stop on a prairie switch. Beside a ditch just over the fence I made out the motionless form of a Wilson's Snipe. The poor fellow stood there on one foot during the whole five minutes of our stay, and did not so much as wink, for all I could see. The Long-billed Curlew was the only species added to the life list in North Dakota. At

one place they were numerous. As we neared the Minnesota line native trees began to put in appearance, and water became more abundant. But across the river in Minnesota the physical conditions seemed so different that a separate horizon was kept. It will be seen from the lists that the bird life was not a little different also. Doubtless more Minnesota forms would have been seen in North Dakota if the time of day had been favorable.

North Dakota. Aug. 14.

Pectoral Sandpiper.
Yellowlegs.
Solitary Sandpiper.
Bartramian Sandpiper.
Long-billed Curlew.
Killdeer.
Prairie Hen.
Prairie Sharp-tailed Grouse.
Mourning Dove.
Marsh Hawk.
Swainson's Hawk.
Ferruginous Rough-leg.
Desert Sparrow Hawk.
Prairie Falcon.
Burrowing Owl.
Belted Kingfisher.
Western Nighthawk.
Red-headed Woodpecker.
Red-shafted Flicker.
Kingbird.
Arkansas Kingbird.
Desert Horned Lark
American Crow
Bobolink.
Western Meadowlark.
Brewer's Blackbird.
American Goldfinch.
Chestnut-collared Longspur.
Western Vesper Sparrow.
Western Chipping Sparrow
Song Sparrow.
Lark Bunting.
Cliff Swallow.
Barn Swallow.
White-rumped Shrike.
Red-eyed Vireo.
Brown Thrasher.

In Minnesota timber became more abundant and small lakes glimmered everywhere. Here and there broken skeletons of huge trees told the story of great forest fires, and brought back the picture of the fire swept mountain sides bristling with blackened needles. We have passed from the desert into a garden.

Western Minnesota. Aug. 14.

Pied-billed Grebe.
Blue-winged Teal.
Great Blue Heron.
Wilson's Snipe.
Greater Yellow-legs.
Yellow-legs.
Mourning Dove.
Nighthawk
Kingbird.
Prairie Horned Lark.
American Crow.
Bobolink.
Red-winged Blackbird.
Western Meadowlark.

Marsh Hawk.
Red-shouldered Hawk
Sparrow Hawk.
Black-billed Cuckoo.
Belted Kingfisher.
Red-headed Woodpecker.
Flicker.
Bronzed Grackle.
American Goldfinch.
Western Vesper Sparrow.
Song Sparrow.
Dickcissel.
Barn Swallow.
Yellow Warbler.
Western Yellow-throat.

At midnight we were in the St. Paul depot, the first train out leaving at seven the next morning. So far as eyes could see St. Paul has a midnight closing ordinance, rigidly enforced, which applies to saloons, hotels and boarding houses indiscriminately. But the depot was warm and the seats arranged for one—sitting upright.

The day on which I should again be at my old Iowa home opened ornithologically as we were crossing the Mississippi River, where four of the five possible swallows were breakfasting. The bird world had now become wholly familiar, and beyond the likelihood of introducing anything new, yet it was none the less interesting. I felt among friends and familiar acquaintances once more, after weeks of foreign travel. The greatest interest attached to the changing physical conditions well illustrated by the farming interests. Passing through the distinctively wheat belt and the transition belt, poorly defined of course, we emerged into the midst of the great corn belt. Never have I seen such corn ! It was simply a marvellous crop, barring accidents late in the season. In natural things one could not help remarking the disappearance of the continuous or nearly continuous woods of Minnesota, and in its place the woods-dotted rolling prairies of Iowa. In the more settled regions Minnesota and Iowa can not be told apart.

St. Paul, Minn., to Grinnell, Iowa. Aug. 15.

Greater Yellow-legs.
Yellow-legs.
Solitary Sandpiper.
Spotted Sandpiper.
Mourning Dove.
Red-tailed Hawk.
Broad-winged Hawk.
Sparrow Hawk.
Yellow-billed Cuckoo.
Cowbird.
Red-winged Blackbird.
Meadowlark.
Baltimore Oriole.
Bronzed Grackle.
American Goldfinch.
Vesper Sparrow.
Lark Sparrow.
Dickcissel.

Red-headed Woodpecker.
Flicker.
Chimney Swift.
Kingbird.
Phœbe.
Prairie Horned Lark.
Blue Jay.
American Crow.
Bobolink.
Cliff Swallow.
Barn Swallow.
Tree Swallow.
Bank Swallow.
White-rumped Shrike.
Yellow Warbler.
Western Yellow-throat.
House Wren.
Robin.

Readers of THE BULLETIN must be familiar with the landscape surrounding Grinnell, from former descriptions of mine. It is but a part of this same woods-dotted rolling prairie, upon which countless artificial groves have sprung up with the farm houses. There is now practically no native prairie in all that region. In a quarter of a century great changes have taken place which have seriously affected some birds, causing more or less modification in the habits of most of them, but the fauna is made up of the same species still.

I was at Grinnell from August 17 to 25, always on the lookout for birds, but making only two special efforts to find them. One of these was an early morning, when 33 species were recorded, some of them fall migrants. The other was an hour spent in the old home woods where birds first came to be anything to me. It was mid-afternoon. The wealth of bird life in this singularly favored spot is attested by 31 species seen. But the day of its glory has passed. Next June corn will spring up where trees have stood for centuries. One of mother Nature's pearls has been cast before—but it isn't the old home any more.

Grinnell, Iowa. Aug. 17–25.

Yellow-legs.
Spotted Sandpiper.
Bartramian Sandpiper.
Killdeer.
Bob-white.
Mourning Dove.
Cooper's Hawk.
Red-tailed Hawk.
Red-shouldered Hawk.
Sparrow Hawk.
Screech Owl.
Yellow-billed Cuckoo.
Bobolink.
Red-winged Blackbird.
Meadowlark.
Baltimore Oriole.
Orchard Oriole.
Bronzed Grackle.
American Goldfinch.
Field Sparrow.
Towhee.
Rose-breasted Grosbeak.
Indigo Bunting.
Dickcissel.

Black-billed Cuckoo.
Hairy Woodpecker.
Downy Woodpecker.
Flicker.
Red-headed Woodpecker.
Whippoorwill.
Nighthawk.
Chimney Swift.
Ruby-throated Hummingbird.
Kingbird.
Crested Flycatcher.
Phœbe.
Wood Pewee.
Traill's Flycatcher.
Least Flycatcher.
Prairie Horned Lark.
Blue Jay.
American Crow.
Cowbird.
Cliff Swallow.
Barn Swallow.
Bank Swallow.
Rough-winged Swallow.
Bell's Vireo.
Black and White Warbler.
Yellow Warbler.
Western Yellow-throat.
Wilson's Warbler.
Canadian Warbler.
American Redstart.
Catbird.
Brown Thrasher.
House Wren.
Short-billed Marsh Wren.
White-breasted Nuthatch.
Chickadee.
American Robin.
Bluebird.

A night and the following half day spent with Mr. Benj. T. Gault, at his delightful suburban home in Glen Ellyn, Ill., was a most grateful rest and change from the pushing crowds of the "Windy City." We enjoyed going over together the ground where Mr. Gault made his "Early Summer Horizons" for Milton Township, DuPage County. The writer also had the pleasure of looking upon the bush where the first Kirtland's Warbler for Illinois sat. The muddy borders of a small lake afforded excellent feeding for a company of sandpipers, while the surrounding woods were filled with returning warblers. No less than 43 species showed themselves during the early twilight tramp. During the post-breakfast walk into the fields eight more were recorded, making an unusually good half day's work.

Glen Ellyn, Ill. Aug. 28.

Pied-billed Grebe.
Great Blue Heron.
Least Sandpiper.
Yellow-legs.
Solitary Sandpiper.
Spotted Sandpiper.
Mourning Dove.
Red-tailed Hawk.
Red-shouldered Hawk.
Baltimore Oriole.
American Goldfinch.
Field Sparrow.
Song Sparrow.
Rose-breasted Grosbeak.
Scarlet Tanager.
Cliff Swallow.
Barn Swallow.
Cedar Waxwing.

Yellow-billed Cuckoo.
Belted Kingfisher.
Downy Woodpecker.
Red-headed Woodpecker.
Flicker.
Nighthawk.
Chimney Swift.
Kingbird.
Wood Pewee.
Traill's Flycatcher.
Prairie Horned Lark.
Blue Jay.
American Crow.
Bobolink.
Red-winged Blackbird.
Meadowlark.
White-rumped Shrike.
Red-eyed Vireo.
Yellow-throated Vireo.
Black-and-white Warbler.
Tennessee Warbler.
Black-throated Blue Warbler
Magnolia Warbler.
Blackburnian Warbler.
American Redstart.
Catbird.
Brown Thrasher.
Short-billed Marsh Wren.
Chickadee.
Wood Thrush.
Olive-backed Thrush.
American Robin.
Bluebird.

There are occasions when we wish for the abundance of time which seems to be at the service of the Orientals. It was but a short call, scarcely more than a glimpse, with a few of the many Chicago friends. But even a glimpse remains as a pleasant memory.

The return from Glen Ellyn to Chicago marked the close of the ornithological reconnoissance, for we left Oberlin at nightfall and returned during the night. The time covered was thus exactly two months—June 29 to and including August 28. The states traversed are Missouri, Kansas, Colorado, New Mexico, Arizona, California, Oregon, Washington, Idaho, Montana, North Dakota, Minnesota, Iowa and Illinois, not to mention a few hours spent in British Columbia among the Band-tailed Pigeons. There were stops, from inconsiderable to considerable, in New Mexico, Arizona, California, Washington, Montana, Iowa and Illinois. Idaho should really be counted out, since darkness hid it from view. Of course there was much of the country passed over during the night which could not be seen, and not a few breaks in the bird life, but on the whole there was far more profit than loss. A second time over the same ground would no doubt discover some species overlooked the first time, but under practically the same conditions there would necessarily be far smaller results.

The species recorded number 309, 181 of them being new to the writer's life list. Of this number (181) only 18 were seen

aboard train and then only, while the remaining 163 were approached closely enough to make identification certain, or were captured. Among these 18 there are none about which there can be any reasonable doubt. Either the region in which they were seen made a mistake out of the question, or else their characters were unmistakable, usually both. Taken all in all it was a most enjoyable and satisfactory horizon, with Pasadena the brightest spot. To one who knows only the region east of the Great Plains the mountain fauna is pretty sure to be disappointing, even after repeated and urgent warnings from those who know. Unknown conditions make an understanding of these warnings impossible. But the scenic grandeur and beauty of the mountains more than compensate for the paucity of bird life. I am bound to say, however, that in my opinion the bird life would not seem so little were it less difficult to follow the moving companies. It is like an Ohio winter woods, where one unacquainted with the habits of the birds may roam the woods for hours without so much as hearing one bird, simply because he does not happen to come upon one of the roving companies. So on the mountain side one has to choose his way with great care; he must wait for the birds to come to him, for he cannot go to them. But the birds one sees upon the mountain tops are among the most interesting to be found anywhere. In the wooded valleys and canons there is no lack of individuals. The greatest difficulty here, on the west side of the Cascades, is the stupendous height of the trees and the impenetrable tangle of the underbrush.

There can be but one thing better than this reconnoissance, and that is another similar one.

LYNDS JONES, Oberlin, Ohio.

ERRATA.

Page 5, line 19, for "fins" read "fin," and line 23, for "rules" read "rule."
Page 16, line 19, for "Pied-bill" read "Pied-billed."
Page 17, left column, 3d name, for "Flnch" read "Finch."
Page 18, at bottom, for "Majave" read "Mojave."
Page 22, line 5 of coarse print, for "valey" read "valley."
Page 24, insert the following horizon:

Cascade River Basin. July 30–31.

Bonaparte's Gull.
Oregon Ruffed Grouse.
White-tailed Ptarmigan.
Band-tailed Pigeon.
Bald Eagle.
Richardson's Merlin.
Desert Sparrow Hawk.
American Osprey.
Belted Kingfisher.
Harris's Woodpecker.
Pileated Woodpecker.
Northwest Flicker.
Western Nighthawk.
Black Swift.
Vaux's Swift.
Allen's Hummingbird.
Rufous Hummingbird.
Calliope Hummingbird.
Western Wood Pewee.
Western Flycatcher.
Steller's Jay.
Oregon Jay.
Clark's Nutcracker.
American Raven.
Northwest Crow.
Pine Siskin.
Oregon Junco.
Cassin's Purple Finch.
Rusty Song Sparrow.
Black-headed Grosbeak.
Lazuli Finch.
Lutescent Warbler.
Yellow Warbler.
Audubon's Warbler.
Macgillivray's Warbler.
American Pipit.
American Dipper.
Western Winter Wren.
Rocky Mountain Creeper.
Red-breasted Nuthatch.
Chestnut-backed Chickadee.
Western Golden-crowned Kinglet.
Townsend's Solitaire.
Russet-backed Thrush.
Dwarf Hermit Thrush.
Western Robin.
Varied Thrush.

Page 32, line 8 from bottom, for "untl" read "until."

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THE WILSON BULLETIN.

No. 34.

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Issued Quarterly by the Wilson Ornithological Chapter of the Agassiz Association.

GENERAL NOTES.

EDITED BY FRANK L. BURNS.

Subscription 50 cents a year.

Berwyn, Penna., March, 30, 1901.

COPY

An unabridged and unaltered reproduction
of the original issue

THE WILSON ORNITHOLOGICAL SOCIETY

March 1985

THE ROUGH-WINGS OF THE HERCULES.

The Hercules with her guns and war-paint taken off, was ır station tug at Port Royal. A powerful old sea-going tug oroughly refitted and just what we needed. I was on the antucket then and came astern one morning in the light skiff ith the regular report. Forward on the Hercules was old ıhnny Greek, who ordered me to moor my boat further aft so ı not to disturb his birds. He didn't seem to be as crusty as ıual, so I asked to see his birds, supposing he was trying to raise ıme young Mockingbirds. I was much amused when he ıinted out a pair of Rough-winged Swallows that were frollick-g around above the dry dock that was just ahead of us. ıhnny stoutly asserted his claim to them, and in a minute or ro one had procured a straw and with much chatter and con-atulation from its mate, flew with it right into the port hawse-pe of the Hercules. This was something new to me. I had ways seen the Rough-wings burrow in sand banks, though I ıd read of their nesting under bridges and in sheltered crannies. he old Greek sailor I found was protecting them well. He ıd the deck plug of the hawse-pipe neatly battened down and ould not let any of the crew handle the hose forward but him-lf when they washed down decks. He was worried about eir feed he told me. Said they wouldn't eat potatoes, or gs or rice, and he was afraid they would go somewhere else he didn't furnish them with the proper dainties. I explained e matter as well as I could to him, and every trip after we had tle consultations and he gave me all the news about his pets ıd their smart doings. They seemed to occupy a very big ace in his old heart. One day he called me in to back a letter his mother, which I used to do for him every pay day be-

cause I could write her name in Greek, and he confided to me that he had told her about the little "Rough birds."

Three times a week the tug went up to Beaufort for groceries, etc., and the little birds seemed to think it was a pleasure trip for their special enjoyment. In town they tried to make friends with the Sparrows about the wharf, and came near having a pitched battle over some building material one day, but their watchful guardian scattered the contestants and brought away half a bucket full of rubbish for them to select from in peace.

Then there were eggs at last. When John tried to peep at them, the little hen "bit him" and he had the finger to show for it too. She was "scrabbich too much" he said. Trouble was nearby. A big derelict was drifting around somewhere about Cape Romain and several ships had narrowly missed disaster by it. The Hercules was ordered to put to sea, find it and blow it up. Away she went bright and early one morning, and was gone five days. When she came back a very dragged looking little Swallow was on the truck above the pennant. The other, Johnny had tucket away somewhere below. When the first big sea struck her down on the bar, Johnny had pulled out the plug and rescued the little mother, but her eggs and nest were past his aid. A day or two they mourned around, but soon set up housekeeping again in the same place. All went well and a young brood tried their wings from the rail of the Hercules but never came back. The same little pair, much more sober and sedate now and with much less chatter than in their younger days, at once began to renovate their old quarters. But the Hercules was ordered to Norfolk with all her crew. When she started off gayly that morning with much saluting of whistles and all her gay bunting flying, do you suppose those wise little birds went with her? No indeed. I became Johnny Greek's residuary legatee. For they came on board the Nantucket, made a careful survey and then took up their residence in one of the peep holes of the conning tower. When the Nantucket in turn was taken away, they were at some fashionable winter resort in the tropies. I look for them back this Spring. The Accomac has just as good hawse-pipes as those they liked so well on the Hercules.

W. J. HOXIE, *Beaufort, S. C.*

BACHMAN'S SPARROW, IN DeKALB COUNTY, GEORGIA.

On the morning of June 1st, 1899, while tramping over an old field, a short distance from my home, my attention was attracted by the song of a bird, the peculiar notes of which I had never heard before.

It was some little time before I succeed in locating him, as he possessed a way of his own, of evading every effort on my part to find him.

He seemed to be here, there and everywhere, all at the same time, for when I advanced toward the direction of his voice, his song would cease, then in a few moments it would be heard again in some other part of the field.

He did not at any time appear to be far away, but like some invisible airy nothing, he stole around, and about me, without my obtaining the slightest glimpse of him.

Finally I secreted myself beneath the branches of a low persimmon tree, with the avowed determination of remaining with my new found friend for the day. After a short time of eager waiting I saw a bird fly from a clump of blackberry bushes and light on the dead limb of a pine sapling but a few yards away. As soon as he touched the tree he assumed a crouching position, much in the manner of a bird attempting to screen himself from view, but in a trice he stood erect, and then that little bit of a wee mite of a bird begun his wonderful song, which eclipsed anything in the shape of bird music I had ever heard.

Without an effort he stood upon that old dead branch and warbled the song he had learned so well. No turn of head, no jerk of his tail, no spread of his wings, or movement of his feathers, save a slight swelling of his throat, as he poured forth his sweet refrain immindful of the world around him. The song continue for one or two minutes, when there would be a kind of of intermission of one or two mintues more, during which time the bird would busy himself arranging his plumage preparatory to another performance, which made me want to clap my hands by way of encore, but fearing he would not respond, I dared not to do it.

Tone of the notes were similar to those of the Indigo,

Bunting, but more continued, louder and stronger, wh wind up of this indescribable melody, was not unlike t talic clink of the well-known Bobolink.

In some parts of his song the bird became a veritab triloquist. At times I caught myself turning my head t hear the notes of the same bird, which appeared to com a songster in another direction.

A slight but intentional movement on my part start bird, causing him to fly to another pine tree some thirty away; so to avoid a misfortune, I "brought him dowr soon held him in my hand.

The specimen was sent to Mr. F. L. Burns, of B Pennsylvania, who without being positive, pronounced m Bachman's Sparrow. It was afterwards sent to the sonian Institution, where Dr. Richmond verified Mr. identification.

The spot where the bird was captured is an old tur field, so common in our Southern Country, and is well to the wants of the Bachman's Sparrow. For years th has remained uncultivated, and has a waste of broom s kind of coarse grass which grows wild on barren and ne places. For the purpose of pasturage this field has been " off" every Spring. This, with the constant grazing of ca caused a short stiff stubble to form upon it. Here an over the entire field grow blackberry briers, and thorn while the whole is overgrown with low stunted growth of mon, oak, pine and sumach. The field includes an about twenty acres, with a common country road through it, dividing it into two nearly equal divisions road is used constantly by teams going to and from Atlar the tree from which the bird was shot, stands not more dozen yards from the center of this thoroughfare. I r this road as argument to show, that while the Bachman' row, though a shy and timid bird, never courting the p of man, does not turn from his chosen haunts to shun h

On the 20th of June of the same year, while walki the same field again, I secured one male, one female a young but fully fledged birds, the sex of which I was

to determine. I afterward found an empty nest about fifty yards from where the birds were taken.

On April 28th, 1900, I secured another male in the same field, about two hundred yards from where the other specimens were found. This was a smooth, clean bird and probably had not yet found a mate. Thus ends my experience with the Bachman's Sparrow.

Some other time, I trust I may be able to write of this bird, that it is "fairly common" in DeKalb County, Georgia.

ROBT. WINDSOR SMITH, *Kirkwood, Georgia.*

CROW LANGUAGE.

While watching *Corvus americanus* at all seasons of the year and listening to their various cries, I have frequently been impressed by the individuality shown in their most common notes, no two birds appearing to have voices exactly alike, whether found in pairs, small companies or great flocks. Perhaps they are few collecting oologists who have not noticed the dissimiliarity in the notes of the sexes about the nest. While not doubting but that they possess a simple language of their own, the difficulties of interpretation are greatly increased by the wide variation occasioned by this same individuality. In saying that the Crow probably possesses a language, it need not be infered that it is meant to assume that it has acquired conversational powers, but merely through the articulation of a few sounds it is able to convey to its own species its sense of pleasure, fear, anger, etc., in other words a vocal code of signals familiar to its associates.

In my mind there is no question but that the manner of utterance is of higher value than mere difference in note. A note possesses various meanings according to the pitch and manner of uttering it. It would be difficult if not utterly impossible to discover and record the language or dialect of a savage tribe of our fellow human beings merely by a stolen and occasional hearing of scraps of conversations, then how much harder it would be

to fully interpet the Crow under similiar conditions without being able to analyze their feelings and conditions, and without imperfect means for the correct portrayal of their voices. The national note of Crowdom is a loud and harsh *caw, cawh*, as given by Bendire, or *Khrah* according to Langille. It has variety of meanings, pitched high it may be a call, an alarm or to attract attention. Falling inflection:—answer to call, reassurance, an all is well signal, uttered with more than ordinary energy it denotes alarm, anger, or merely that the argumentative powers have been aroused. Softly—caution but not immediate danger, often used by sentinal and occasionally about newly constructed nest. A soft and caressing *Ca-awb* while working upon the nest, relieving brooding mate, or training young, sometimes heard, most frequently voiced by the male. The next most popular note is the clear and ringing *Co*, the most musical of the whole vocabulary. It is usually given four or five times in succession and is nearly always in the form of a call. *Kar-r-r-r-r* is ordinarily or brooding note of warning. Very soft if only to warn mate into silence, but hard and vicious if voiced in face of intruder. Bendire gives it as *Krab*; other modifications are *Kar-r-r-r* and *Kur-r-r-a*.

Kar-ruck, (emphasized on the last syllable) has an indescribable hollow, guttural, clicking sound, most frequently heard in the late winter or early spring, although I have heard it not infrequently late in November. Probably the best attempt at song, although I am inclined to attribute it largely to individuality, as I have marked birds in flocks during the winter and in certain groves in the breeding season which have regularly used it; while the majority do not appear to have included it in their vocabulary at all. The modification are *Kar-r-r-ruck, Kar-rack*, and *Ku-rack*.

A loud and quick *clock-clock-clock* is rather unusual. It shares the percularity of sound of the previous note but is even more hollow. I have always noticed that the bird was at rest on or near the ground when uttering it. I have considered it as abnormal.

Another, are series of notes, was heard one cold day in

February, a low sputtering, rattling *Kek-ek-ek-ek-ek-ek-ka-ah* repeated, at first suggesting a Kingfisher, from a single bird as it flew about near the ground, feeding.

The love note of the male is a *Cow-cow-cow-cow* or as Langille has it—*Chow-ow-ow-ow*, low and deep.

The female's love note is a series of strange cries, *Caw-caw-caw-caw-caw-co-co-co*, beginning soft and nasual but after the first two notes increasing in force and measure until broken off.

As previously stated, Langille has recorded love notes of the male, but I believe Maynard to be the only ornithologist who has described at length the courtship of a pair, and in all probability he has too highly colored his discription. Before giving my own version I will quote him, as his *Birds of Eastern North America* is not accessable to many: "It may seem absurd to talk about Crows singing, but having heard their performance, I can bear testimony to the excellence, that is comparatively speaking. I was once watching a pair of Crows that were building in a small grove near Newtonville, and, as I had succeeded in gaining a place of concealment not far from the birds, without attracting their attention, had a fine opportunity of observing their movements, while they were entirely unconscious of my presence. The first thing I noticed was a peculiar sound which somewhat resembled the cooing of a Dove, but it was far more musical. As only one of the birds was discernable from where I stood, I could not at first make out from what direction it came, but after a moment moved slightly when I saw at once the author of the singular melody was no other than a Crow, evidently a male; it was seated on a limb of a tree by the side of its mate and he behaved in an odd manner for so grave a bird. He would move sideways on his perch, bow his head, spread his tail, and droop his wings, at the same time giving utterance to a cooing note. The female watched him demurely all the while but made no demonstrations whatever, and, after performing some five minutes, both flew away."

My first witness of this highly interesting performance was in the afternoon of the cold day of April 20th, 1897, and from the notes taken on the spot it will be seen that no doubt is left as to the sexes. The female was about three hundred yards

from the newly constructed nest. She appeared entirely oblivious to my presence although the trees were yet destitute of foliage, but appeared very restless, constantly shifting her position from one tree to another a few yards at a time. Acting in the manner of a very hungry fledgling just out of the nest, with wings now drooping helplessly, now half extended, tail opening and closing, falling and rising; head thrown back and from side to side; accompanied by uncouth movements of the body; almost constantly uttering a series of strange cries, beginning soft and nasual but growing louder and faster after the first two notes: *Caw-caw-caw-caw-caw-caw-caw-caw-co-co-co-co.* The series of notes were often broken short, and from the bodily contortions and cries of agonizing entreaty, one would suppose that the bird was in the last struggles with death. This continued with brief movements of silence for about fifteen minutes, when I heard, some one hundred yards from the female and directly in the rear of my place of observation, a deep yet softly uttered *cow-cow-cow-cow* from the male, whose presence I had been in ignorance of up to the moment. The female continued her cries for about ten minutes, the male remaining quiet the same period, when a *cow-cow-cow* loud and full was answered by the female as before, immediately after which they both left their perches and flew as to a common center until a few yards seperated them when the female turned pursued by the male in a zig-zag course below the tree tops; copulation having taken place in midair, the female returned and recommenced her cries but less frequently; the male having taken post at some distance. I have since observed the above described performance in other localities, though it must be confessed a less extravagant part was taken by the female, otherwise I would be compelled to regard it as a caricature rather than a normal trait, for I heard it again at 5.30 p. m. March 27th, 1898, and again on May, 6th, 1899, in the identical wood in which the first occurred. It was easily approached to within gunshot range, folding and spreading its wings, hopping or flying up one limb to another and down again in an exceedingly frenzied manner, uttering inarticulate cries similar to the voice of the young. This female was easily recognized by me on account of the

peculiar *Kar-ruck* note it uttered and protested all the Crow and Hawk nest robberies I committed within a radius of a half a mile of its stand. I cannot say for certain whether it had a mate in 1898 or not, although I did not note it about at the time; but investigation failed to discover the male in 1899, and the fact that I failed to take a set of eggs in the three years from this section of the woods although all nests were examined, is significant. The male may have joined another female or as it is highly probable that they mate for life, he may have been shot. The female was undoubtedly barren and to all appearance *insane*. It had probably received some injury about the brain, perhaps from a grain of shot. It was my intention to have secured it for examination but as it was not in its haunts in 1900, my opportunity had passed.

FRANK L. BURNS, *Berwyn, Penna.*

A WISCONSIN BIRD PARADISE.

It was a beautiful afternoon the third week in May, when a friend and myself rode out about four miles into the country, tied our horse in a kindly farmer's yard and struck into the woods. At the edge of the woods a Rose-breasted Grosbeak was singing joyfully. We stood and looked at him for several minutes. A few rods farther on a Scarlet Tanager flew across our path and while I was looking at him my friend saw the Ovenbird walking sedately down a log. We soon came to a clearing, fringed around the edge with half grown maples and poplars, with a grove of beautiful large maples in the center. An old log house to one side with the dense woods all around. It was an ideal spot for birds, and we looked and looked and it seemed as if we could not admire it all enough. While admiring the scenery a loud chip caused us to look around, when we saw the Scarlet Tanager's beautiful mate. She looked at us for a second, then flew up into a tree, and upon following her with our eyes, saw she was perched beside her brilliant mate. Later on I saw them building a nest in an old dead tamarack tree in the dense woods. Following an old grassy road we came to an old tumbled down log bridge,

which we crossed a shallow brook. One side of the stre was the dense woods, the other a tangle of bushes about feet high and the ground rather swampy. Sitting down on old log my friend and myself held our field glasses in readin for anything. We could hear the Grosbeak still singing, a the bushes seemed alive with Warbler songs.

Soon a loud splash, and a Rose-breasted Grosbeak v bathing not ten feet from us. He splashed around well tl flew up in a low tree and went to pruning his feathers. Ir moment a Chickadee went through the same performan then two Blackburnian Warblers made their appearance a lit further on, and they bathed repeatedly and then sat on a tree plain sight and made their toilet.

Then came a pair of Chestnut-sided Warblers followed two Black-throated Green Warblers and all the time the conc was going on. Finally we had to leave and the birds were s bathing. The next week, I went alone, to the same spot, a sat down, in a second a Chipping Sparrow come to the bath place, then a Chickadee, then several Chestnut-sided Warble then followed a Parula Warbler, the first one I had ever se then a Black and White Creeper and several Red-eyed Vire The concert was something bewildering. A Catbird sang j back of me, and the Grosbeaks and Red-eyed Vireos kept a perpetual singing. In a distance the flute-like song o Thrush reached me and over all was the call of *Teacher Teac Teacher*.

I did wish every bird lover could see this beautiful sp Our Northern woods seem very rich in birds. So many spec that the bird books pronounce rare we see very often.

E. S. G., *Antigo, Wis.*

NOTES ON THE MERGANSER SUB-FAMILY.

In the latter part of February the ice in Cuyahoga riv breaks up and the first northbound migrants are Americ Mergansers. First comes the drakes in gaudy white and bla dress, and by the first week in March they are gone and t dun-colored females aud immature males come in with the Ma

lards and Black Ducks. I have never seen males and females on the same day. Totally unfit for food, they are not molested by the hunters and are only useful to the taxidermist. They are wonderful divers and will swallow fish so large that they have to keep them in their throats until the heads are digested by the stomach. A female killed March 7th, 1898, had a shiner ten inches long in her throat and gullet. The tail of the fish protruded from the bill of the duck which was flying when shot.

I killed a large male on Feb. 22, on the river that had several small fish and one seven inch sucker in his throat. The head of the sucker was partially digested.

These Mergansers are unable to take wing against the current and always rise down streams as the current is very swift and they cannot get the resistance of the water against their feet when trying to fly up streams and I have seen them flop along the water for fifty feet against the current in a vain attempt to rise when danger threatened below them.

The Red-breasted Merganser is a more common species and makes its appearance on the lakes about the last week of March.

Traveling in larger companies than the foregoing species it comes well to decoys. Their food consists of fish of the smaller varieties and I have never found any large fish in their gullets. After the ducks season is over they become very tame and associate with the tame ducks on the lakes.

The Hooded Merganser is the smallest of the Mergansers and the only one that is seen here in the fall to any extent. It appears on the lakes in October in small companies, mostly females although a few males are seen. This Merganser is a very fair table duck and compares favorably with Widgeon and Bluebill. The rarest of the three Mergansers with us and the last to arrive in spring this species first appears on the lakes in the first week of April.

WM. B. HAYNES, *Akron, O.*

THE FIRST 20th CENTURY HORIZON AT OBERLIN, OHIO.

According to my established custom, the first day of the new century found me a-field starting the list of species for

the year. The course taken was a little out of the ordinary for this all day winter horizon, yet intended to cover as varied a landscape as the country affords.

Two small woods, a weed grown thicket and several open fields yielded but four species on the way to the head waters of the Beaver Creek. This was partly due to the early hour of the morning, partly to the sharp and brisk south-west wind, partly to the temperature of 18°. The clouds made the twilight linger until nearly eight o'clock, when they partly lifted and did not return until four in the afternoon,

The course led me down the stream to within two miles of Lake Erie, when a mile across country to the west gave me the birds which can be found only in the dense thickets which surrounded and cover the sand-stone knobs so characteristic of the northern part of our county. Where these have not been quarried, or at one time quarried and later abandoned, the thicket loving birds find a paradise.

From this series of woods and thickets one emerges upon the lake shore or the lake swamps as he prefers. I chose to visit the swamps first where disappointment awaited me in the entire absence of Cardinal, which had failed to put in an appearance along the course of the stream. Song Sparrows were numerous here, but Junco and Tree Sparrow were absent.

The three mile walk along the lake front treated me to a disappointment and two surprises. No American Herring Gulls could be seen anywhere even there was little or no ice beyond the shore pack ice. An approaching train started an American Merganser from the water just beyond the shore pack ice. A happy company of seven Snowflakes played hide and seek with me over the rail-road embankment. Why do their voices and every action bespeak the frozen North ?

It seems a little strange that but a single Sparrow Hawk and a single Prairie Horned Lark should have been seen during the whole day. The solitary American Herring Gull was beating its way over the Lorain Harbor toward the lake while I waited for the trolley car. The two Crows and two companies of Meadowlarks were somewhat of a surprise. They are more often absent than present during the first weeks of the year.

have little doubt that Bluebirds, and possibly Robins, were omewhere about also.

A glance at the summary will show that of the 21 species corded the Tree Sparrows were by far the most numerous in dividuals, yet they were far less in evidence during the day an the Nuthatches, Downy Woodpeckers and Tufted Tits, ecause they were always in considerable flocks while the other curred in companies of two to four.

It is worth while to spend a day in the wind and snow hen you can meet 310 birds in their own reception halls!

THE HORIZON.

n. Herring Gull, 1.
n. Merganser, 1.
b-white, 12.
d-shouldered Hawk, 1.
arrow Hawks, 1.
iry Woodpecker, 3.
wny Woodpecker, 11.
d-bellied Woodpecker, 3.
cker, 6.
ue Jay, 14.
adowlark, 24.
Am. Goldfinch, 2.
Junco, 12.
Tree Sparrow, 160.
Song Sparrow, 11.
Snowflakes, 7.
Tufted Titmouse. 12.
Chickadee, 8.
White-breasted Nuthatch, 18
Prairie Horned, Lark, 1.
Am. Crow, 2.

Total 21 species, 310 individuals.

LYNDS JONES, *Oberlin, Ohio*.

A SUGGESTION.

It is generally recognized, as is believed that the modern nd of investigating thought lies more and more directly in e line of specialized effort. This is true with at least several anches of the natural sciences and of late years also seems be holding good in the work produced by many of our best ithologists. Our own chapter publications, for example, ve contributed several noteworthy efforts in that direction, d of which, more recently, the Flicker Bulletin might be favbly mentioned in this connection.

Though Prof. Jones' "Warbler Songs" should certainly

come in for praise, it is with regard to the former production that I desire more particularly to speak.

This Bulletin having met with such a reception and generous appreciation on the part of ornithologists and bird-students in general, would it therefore not seem like a timely suggestion for the members of this chapter—(and others if they should so desire)—to bestir themselves a trifle with the direct purpose in view of rounding out more completely the life-history of this interesting bird ?

The writer feels very sure that its author would gladly assent to such an idea and readily contribute his valuable aid in making a supplementary report possible, which could be treated to required length in a future number of our Bulletin, and perhaps without incurring the additional expenses of producing it separately as in the case of the original report.

Many of us no doubt have notes and items of interest, as yet unpublished, which if brought together under the respective headings, as arranged by Mr. Burns, would furnish a paper of no little importance. The writer has managed to pick up a few such items, originally overlooked, and has heard of others who have forwarded notes of similar character on the Flicker to Mr. Burns. A mutual helpfnlness in this respect should accomplish much; and in this connection, it might be worthy of remark in saying that co-operative monographic studies of our birds will constitute in the main a very great incentive to future ornithological work, and, further, it would not seem like an altogether vague idea to even suggest that every resolute worker of to-day should select his bird.

To get our bird-matters into more tangible shape is really what we should now strive for without requiring the necessity, as at present, of reading through an entire library for the purpose of imforming ourselves more particulary with regard to a single species. Mr. Chapman has thus similarly expressed himself in a recent review of Mr. Burns' work—a statement which many of us will readily concede as true.

There are some of course who may object to such a proposition on the ground of narrow specialism, yet it should not be so understood that our aim is to simply study *one* bird, but

on the contrary observe what we can if all and instead of hoarding our notes, as many if as are now doing, allow others more favorably placed to use them so that we in the end may enjoy and benefit by them as a whole.

By such an arrangement who can possibly foretell the grand results obtainable—besides the cultivation of a more fraternal feeling among us, an idea, by the way, that should not be entirely overlooked.

Scientists, and especially ornithologists, are now entering the field of bird legislation—enactments, in one way and another; therefore, why would it not be an excellent plan for them to get a little closer together? To the writer at least these would appear as questions of some moment, and what others may have to say along the same lines surely cannot fail of interest.

BENJ. T. GAULT, *Glen Ellyn, Illinois.*

GENERAL NOTES.

THE EVENING GROSBEAK.—Said to be a rare bird has been seen twice in our city this winter. It was also seen once last winter. Quite a large flock remained here some two weeks. I also saw a very large flock at Sheboygen last February.

ELLA S. GIBBS, *Antigo, Wis.*

UNUSUAL ACTIONS OF A TURKEY VULTURE, *Cathartes aura.*—Much comment was made on the movements of a solitary individual which acted the part of a scavanger in the back yards of the residents of the northern part of the village during the last two days of November, 1900. At about 2.30 p. m. December 1st I observed it settle on a low branch of a large chestnut tree near the railroad. The temperature was a little below the freezing point. The bird remained some fifteen feet above the ground in a roosting posture and facing a moderate but cutting wind all the afternoon and probably all night as it was not disturbed. It most have been a very aged bird or else a straggler from the south, our local birds being much more wary.

FRANK L. BURNS, *Berwyn, Pa.*

THE FLIGHT SONG OF THE KENTUCKY WARBLER.—The following letter entitled "A Woodland Mystery" was clipped from a Chester County, (Pennsylvania) newspaper last fall:

"Editor *News* :—For three Summers a little bird that sings on the wing has concealed its identity from me.

Its favorite time seems to be just at twilight, when it will swing out from the side of the wood which is close by our door, and after a short semi-circular flight, accompanied by a brief song, will dive among the trees and remain perfectly quiet.

I have heard it early in the morning and again by 3 p. m., but it sings chiefly at about dark, and this, with its manner of doing so, makes it very difficult to indentify.

Only a small percentage of our birds sing in flight, among them the Ovenbird, and as we have a number of these near, and I was not familiar with their air song, I was inclined to put the responsibility on them, but I thought I once caught a gleam of yellow as the singer slid among the trees, and twice I fancied the air song began and changed into the common song of the Kentucky Warbler.

At last, and probably nearly the last time it sang this season, as it closes its programme about the middle of July, I got a sufficiently near and clear view to satisfy me that it was the Kentucky.

The bird is not very common here, or rather, it seems to be quite rare for a series of years and then more plentiful for a while. It is about the size of our Vireos, with bright yellow breast and black markings on the sides of its head, in fact it looks very much like an enlarged copy of the Maryland Yellow throat.

It has nested and raised its young near us for several years, and a part of the time its common day song, sounding like pretty, pretty, pretty, is, perhaps, the most noticeable and constant one to be heard. But so shy is it with its air song that it has taken me three seasons to make sure of it.

EDWARD SWAYNE.

FOOD AND GRAVEL.—In collecting a series of skins of the Song Sparrow, I was struck with the large amount of gravel

found in their stomachs in comparison with those of some members of other families. For instance the Robin which is a common winter resident here, some ten or twelve stomachs examined contained little gravel; they are filled with everything like an insect that can be found, more particularly a small white larva which they seem to pull out of the ground but which I have not been able to find in the very places where they have been feeding. Where the old "turned out" fields have been burned over, the Robins are the most plentiful and there they seem to find most of their food. The stomachs appear to contain more dirt than gravel, although a small amount of sand or gravel is evident.

Of course the Song Sparrow is a hard-billed bird and it not only swallows a much larger amount of gravel in proportion to its size in comparison with the Robin, but it is particular to the kind it takes into its stomach. Those that I have taken this season have been secured in low marshy ground adjoining streams. In these little streams, often mere ditches, is found small white gravel mixed with the gravel of a dark brown color, and the white gravel is invaribly found in the gizzards of these little birds. Of course the reason is obvious why a seed-eating bird requires more grinders than one that is purely insectivorous, but what is the virtue of the white gravel alone ?

Another thing I have noticed is that birds like many other bipeds "only scratch for a living when necessity make scratching compulsory." Mockingbirds, Catbirds and Brown Thrashers though insectivorous, will simply move into a wild cherry tree or a place where the berries of the pokeweed are ripening, and stay until everything in the fruit line is consumed. An examination shows that few or no insects are found in their stomachs at this time, and the underparts of their tails are stained with the juices of the fruit, being plainly seen when they take flight. It is a common saying of the negroes of the South when speaking of a man when drunk that "his face looks like a Catbird's tail in pokeberry time."

ROBERT WINDSOR SMITH, *Kirkwood, Ga.*

VERNANCULAR ORNITHOLOGY OF DELAWARE.—When business called me to the Southern border of Kent County,

Delaware, for a few days in midsummer, I had hoped to do something in the ornithological line in the moments of leasure which come to us all. For reason's unexplained the Blue Hen's Chick has not been "in it" ornithologically. I am unable to recall a single prominent name identified with the avifauna, indeed very little appears to have been written when compared with the activity of surrounding States. The list made by me was not a large one—58 species. Birds were for the most part silent and moulting. Then the temperature was against me, the mercury often well above 100° F., and few excursions were made. The Turkey Vulture flying about the village and down in the back yards in a semi-domestic state was a most novel sight to me.

I made the acquaintance of a resident who had made a collection of eggs some years previous. I shall never forget the conversation I had with him one evening while seated on the bank of a large mill dam waiting for the festive "Bull head" to bite. "Yes-sur, I've took de eggs of about all kinds of birds dat nest aroun' yer—de Blackbird, Bluebird, Yellowbird, Redbird, Indigobird, Railbird, Ground Sparrow and Tree Sparrow. See dat ole Crane flying up creek? No sah, never took no Crane eggs, dey build too high, but I done took Mudhen's, and plenty of Killdee, Patridge and Turtle Dove—Buzzards too. Dat Fisher's after yellerneds—we call him Kingfisherman sometimes. What kind of Hawks and Owls? Why down yer we have 'em all—Fisher Hawk, Hen Hawk, Turkey Hawk, Privteer, Bird Hawk, and Cat Owl, Booby Owl, and little Squinch Owl." (Osprey, Redtailed, Red-shouldered, Cooper's and Sparrow Hawks; Great-horned, Barn and Screech Owls,) "Three kinds of Crows—Chicken Crow, Jackdaw Crow and Rain Crow," (American and Fish Crows, and Yellow-billed Cuckoo.) We got a little bit of a bird aroun' yer called Locust, never seen it but once, can't describe it, but it sings jes' like a Locust. No, not Locustbird, jes' Locust, (Probably the Blue-winged Warbler.) Thar's another little bird that used to build its nest all covered with moss on a limb, that's the Tomtit." (Blue-grey GnatCatcher.) "Not many Woodpeckers, only the Big, Little and the Yellow-hammer" (Pihated, Hairy

and Flicker) "Them thar's Bullbats flopping over the water. We used to find plenty of their eggs but no Whipper-will's eggs. Reckon the Whipper-will's the old he-un and the Bullbat's the she-un, for I never heard the Bullbat sing." The local names of the Spotted Sandpiper and Green Heron followed but are too fearfully expressive for these pages. We had nearly exhausted the list of some forty species which he asserted was all that nested thereabout, some few of which we both knew by the same names, but—"Mockingbird? Yes-sir, we got *two* kinds, the English and the French Mockingbirds. Oh yes dey's both Mockers shore, but the English's the best." The last remark deserves more than a smile when one discovers that this title designates the Southern Mocker, knowing that it ranks above the Brown Thrasher as a songster. Truely the early settlers, from whom this and many other of the local names originated, thought the word "English" donated something a little superior to that of "French." I also heard the Brown Thrasher called "Red" and "Rusty Mockingbirds."

FRANK L. BURNS, *Berwyn, Pa.*

EDITORIAL.

With the completion of the October number, Professor Lynds Jones who has so ably conducted the WILSON BULLETIN for the past seven years, retires from the editorial chair, and the writer assumes the management for the current year. It will be continued as near as possible on the same lines as heretofore. It is essentially an outdoor bird students' journal, appealing for support to no particular faction or hobby, nor to state or sectional pride, but rather to that growing body of everyday bird lovers. The BULLETIN has survived scorces of more or less pretentious ornithological periodicals. It has seldom failed to give more than value received. To many of its subscribers it has been a training school, teaching honest, paintaking, perservering observation, accuracy and fluency in description, which has resulted in increasing experience and proficiency in the field selected, and the accumulation

of valuable data without which no great principle can be envolved. It has also encouraged specialism and co-operative study as most certain to give satisfactory results, holding that no one person can be fully competent to study a bird from every standpoint and individually obtain complete knowledge of its life. To those in sympathy with the work and purposes of the Chapter, we appeal for aid and encouragement. This is not a money making venture, but it is kept in existance by the pride and sacrifice of the members. Like all scientific journals, back numbers increase in value as time passes and no ornithological library is now complete without a file of the publications of the WILSON ORNITHOLOGICAL CHAPTER.

As formerly the membership dues should be sent to the Treasurer—Prof. Lynds Jones, Oberlin, Ohio, and applications for membership to the President—Reuben M. Strong, Cambridge, Mass., but subscriptions, exchanges, manuscript, and other business communications should be addressed to the Editor—Frank L. Burns, Berwyn, Penna.

In another page we publish a communication from Mr. Benj. T. Gault, and would be pleased to hear from any of our readers pertinent to the suggestions he has offered and in due time the additional notes, comments and corrections, of which we already have a few, will be placed in the form of a suppliment to be placed inside the covers of BULLETIN No. 31, or published in some future number of General Notes, according to the wishes of of the readers. In connection with the above we would enquire whether anyone has discovered the adult Flicker in the act of removing the excrement of the young while in the nest cavity; and to those who may have examined one or more broods in the nest, we would be pleased to know in what condition the nest was found. Under the head of Young the statement was made that the parent bird does not clean the nest. This is undoubtedly too broad an assertion as the writer has found some nests with the young singularly clean while other cavities were far from cleanly. Several nests of the Downy Woodpecker containing large young were examined and found to be perfectly clean. This subject will bear further investigation.

Many of the old *Ornithologist and Oologist* readers will recognize a familiar pen in our leading article. Mr. Walter Hoxie contributed frequently to that magazine in its most palmy days. We hope to catch him in a reminiscent mood soon and have him write of hunters and ornithologists now dead but not wholly forgotten, and of incidents and adventures long past, away back when the Passenger Pigeon was trapped and the Labrador Duck shot to eat.

Plans for the future numbers have scarcely been formulated, but we can pronounce something of interest for every issue. Professor Lynds Jones and others will continue the "Bird Horizon"; an interesting episode in the life of Alexander Wilson which has only been touched upon previously, will be given; and articles and notes of general interest contributed by others of our members and subscribers, will serve to maintain the high standard set by our predecessor.

It is small wonder that Gmelin, Wilson, and a few others of our earlier Ornithologists should have failed to discover the dichromatic state of the plumage of the Screech Owl, but regarding the grey phase as totally distinct from the red phase and naming accordingly; knowing so little of its life history as they did; but it is just a little queer that Bonaparte, Audubon, Nuttall and Cassin should have made almost as great a mistake in correcting their predecessors, for they believed the grey plumaged bird to be the adult and the bird in the red or rufous plumage the young; and it is only within the present generation that the full truth has been known. At this date how many know the predominating color and proportion of one to the other in a given locality? And whether the males are more given to the red or grey coloration than the females, or vice versa? Let every reader sit down and copy off a list with locality, of the reds, greys, and intermediate grades captured, and observed, as far as possible subdividing them as to sex and age—giving males and females, adults and young under each phase of plumage. It ought to make an interesting list as all are familiar with our little Screech Owl, and the editor will be glad to publish the results in tabulated form in the next BULLETIN.

It is but fair to warn the reader that the honors of editorship are not of our seeking, that it can be but an incident of a not a unbusy life, and that the position is an unfamiliar one; we do know that no magazine can be successfully conducted without an abundance of manuscript to select from when making up a copy for the printer. It is also necessary in this instance that it should be written by bird lovers, or by persons sufficiently observant and in positions to give unbiased statements of value to the Ornithological world. We want to hear from the Ornithoiogists because they are engaged in perfecting the science of bird sand always have something to say. We want to hear from the Oologists because they have done more to popularize the study in the past then any other class, and are a persistant, hardworking and observant body. We want to hear from the Audubonists because they are now continuing on a higher plane the work the Oologists began, and are very much in earnest. This shall continue to be the neutral ground where all shall meet on equal terms.

PUBLICATIONS RECEIVED.

The Bittem, edited and published bi-monthly by Glen M. Hawthorn, of Cedar Rapids, Iowa, is a small but neat periodical. The August number contains articles by Dr. Morris Gibbs.

The Petral makes it initial bow at the beginning of the century. The first number is 16 pages and cover, well edited and presents a very good appearance. It contains articles of varying length and merit by such well-known writer sas James J. Carroll, William L. Kells, Walton S. Mitchell, Ellis F. Hadley, and others. It is edited by John William Martin at Palestine, Oregon.

American Ornithology, published monthly by Charles K. Reed, Worchester, Mass. is somewhat different from the usual bird magazines. It is proposed to give the life histories of several species each month. The February number contains the

second installment which is sufficiently varied to please all. The Semi-palmated Plover, Great-horned Owl, American Eider Duck, American Osprey and Ruby-throated Hummingbird, are each alloted a full page illustration and two pages of text. The plates are very artistic and the figures easily identified; but the attempt to give the life history of any one species of our birds in a page and a half of matter written in a popular form, while praiseworthy, can scarcely fail of falling short of the desired result. It is to be hoped that Mr. Reed will receive the support necessary to the continuance of a work so expensive, as this must be,

A Summer Reconnoissance in the West is an account of a 7000 mile journey taken last summer by a College Professor and a Clergyman for the purpose of studying the avi'fauna of various localities in the great West. As it is a W. O. C. publication, we shall not review it here; but cannot forbear prohouncing it the most remarkable record of its kind ever made. The Authors were the pioneer advocates of the value of "bird horizons," and are most expert at this work. We would advise those who have not already secured this paper to send 20 cents to Prof. Lynds Jones, Oberlin, Ohio, and get a copy before the edition is exhausted. [F. L. B.]

Our Feathered Friends by Elizabeth Grinnell and Joseph Grinnel, with Introduction by William Palmer. Published by D. C. Heath & Co.

This little volume of 144 pages is written for children in a language which can easily understand. It has grown of a deep love for the birds and a keen desire to start the children on the right path. The subject matter is largely drawn from the personal experiences of the authors in their efforts to make friends among the birds, and is so full of life and color. The illustrations in the text are mostly drawn for this book to tell something definite about the bird or birds figured. The three full page photographs of the Hummingbird family cannot fail to greatly interest all. If there is one thing of more interest than another in this little book it is the story of the two robins taken from the nest in New England and raised and kept in Pasadena.

Here we feel the touch of the bird personality. The book is full of hints how we may gather the birds about us and keep them there year after year. It should be in every home.

[L. J.]

Birds of Pennsylvania, et al, by H. B. Warren, M. D. Published by the Authority of the Commonwealth. The history of the publication of the various "Bird Books" begins properly with the enactment entitled "The Bounty Law" on June 23rd, 1885, the date which it received the Governor's signature. This law in brief was the establishment of premiums for the destruction of certain noxeous birds and animals, namely Hawks, Owls, (excepting the Acadian, Screech or Barn Owls), Wild Cats, Foxes, Minks, and Weasels; "for the benefit of agriculture and the protection of game." It was not until six months had passed or the beginning of 1886 that this law become generally known. The person killing a Hawk or Owl was entitled to the sum of fifty cents for each and every one presented at the office of a Justice of Peace, that official being recompensed for the issuance of certificate and the cremation of the head of the bird, by the further sum of twenty cents per bird. Soon the demands upon the Commissioners and Treasurers of the rural Counties increased at an alarming rate. In eighteen months over $100,000, had been paid out, of this at least $75,000, represented the premiums paid on over a hundred thousand Hawks and Owls, principally the following species, although of course many of the less common species were represented: *Falco sparverius* American Sparrow Hawk, *Buteo borealis* Red-tailed Hawk, *Buteo lineatus* Red-shouldered Hawk, *Accipiter cooperi* Cooper's Hawk, *Accipterv elox* Sharp-shinned Hawk, *Buteo latissimus* Broad-winged Hawk, *Circus hudsonius* Marsh Hawk, *Asio wilsonianus* long-eared Owl, *Asio accipitrinus* Short-eared Owl, *Buteo virginianus* Great-horned Owl.

The "Scalp Act" as it was called soon became very unpopular with the county officials on account of the increased amount of work without extra compensation. This quickly extended to the tax-payers, first from the heavy expense incurred, and later from a doubt as to the wisdom of destroying without

some discrimination of species. The demand for an expert in this line led to the appointment of Dr. B. Harry Warren, of Chester County, as State Ornithologist, newly created and with a fair salary attached. Of this gentleman, Dr. C. Hart Merriam has said, that his investigations, more than anyone persons had led to a better knowledge of the food habits of these birds. Evidently no one in the State was better qualified to serve in the interest of Economic Ornithology than the appointee. To the credit of the people be it said that as soon as they become better informed on the subject, the hunting and killing merely for the bounty ceased to a large extent before the Legislature met and repealed this injudicious law which was unquestionably born of ignorance. Anxious to atone for their blunder and feeling the need of more light on the subject in its entirety to prevent a repetition of such vicious legislation, a bill was passed, and signed by Governor Beaver authorzing the preparation and publication of a Report on the Birds of Pennsylvania. The appropriation was $12,000, for an edition of 6000 copies. This appeared in 1888. It was 200 pages and 136 colored illustrations, the text by the State Ornithologist, and the plates after Audubon. The edition was so limited and the demand so great that in 1889 the Governor signed the bill authorizing the State Printer to issue 19,000 additional copies. This appeared rewritten and enlarged as the second edition in 1890, a handsome volume of 434 pages, 100 colored plates and bound in half morroco; a credit to the great State of Pennsylvania. Previous to compiling this edition, the Author sent out a request for information, accompanied by a provisional list of birds found in the State, for checking or annotating. Seventy-six Ornithologists or Oologists complied, among them the writer sent in his meagre list, fully expecting to receive a copy of the work from the Author's allotment of three hundred, but after vain attempts in all possible quarters, secured a copy in perfect condition for $3.50 at a book store in Philadelphia, where they were to be had at prices varying from $3.00 to $4.50 and $5.00. This was in 1894, long after Governor Pattison had vetoed a bill to issue a third edition, and all hope of receiving a free copy had passed. Outside of the small number

given to the schools, libraries, etc., few books were placed in the hands of those for whom they were really intended. The distribution is a standing disgrace to the Commonwealth. Those who could afford to buy should they have cared for it, were served first, with or without application. Zealous efforts of persons with little political influence to secure copies were rewarded by promises depending on this issuance of another large edition, for fulfillment; or the receipt of copies of an act prohibiting the killing or taking of song or other wild birds, except in certain cases and providing a penalty of a large fine or imprisonment thereto. The Second Edition was said to have been exhausted immediately after it came out, yet seven years after, two days before Christmas, 1897, I personally examined and counted ninty-two perfectly new or unused copies at Leary's Old Book Store in Philadelphia. They were not ever marred by the stamps of a State Official, As they had been on sale for several weeks previous, many must have been disposed of for attractive Christmas presents at a moderate cost, the price being $3.50. It would be interesting to know the source from whence they were procured.

Following the appearance of the separate editions, the conservatism of the scientific reviewers was in marked contrast to the extravagant praise bestowed upon the Author and his work by the public press; we find the most radical and ignorant of the reviewers comparing this work with that of Wilson and Audubon. Owing to some unfortunate errors in identification made by well meaning informants and the apparent neglect of the Author to look more closely into statements at variance with his experience, many local Ornithologists have, unconsiously perhaps, under-rated the Author and his work; which, if not a model, is at least the equal of its kind.

Governor Pattison having placed himself on record as opposing such bills, no more legislation was attempted in this form until 1895, when the House Bill appropriating $100,000, for the publication of 24,000 copies reached the Governor after having been reduced to $28,000, for the same number of copies by the Senate. Rather unexpectedly vetoed by Governor Hastings, there was some talk of passing it over his head as

it probably could easily have been done owing to the general demand, but the framer declined to attempt it, doubtless feeling the trouble of the Executive's words, viz: "Notwithstanding the popularity and value of the work and the general demand upon me especially by the farming people of the State, to sign the bill, I am of the opinion that in the present condition of financial and business affairs, it is not in accordance with wise and prudent economy to spend this sum for such purpose." Words that do him honor, at a time when the whole Nation was suffering from business depression and stagnation; but the point was destined to be gained by methods others than fair and without the Governor's knowledge. "Two officers of the Department of Agriculture, Dr. Pearson, State Veternarian, and Dr. Warren, Economic Zoologist, prepared a pamphlet in 1896, known as 'BULLETIN No. 17' relating to 'the diseases and enemies of poultry.' Thirty-five hundred copies of this pamphlets were printed at the expense of the State and issued by the Department of Agriculture. The edition was soon exhausted and there were numerous demands for additional copies. In transmitting the bulletin it was stated that the State Zoologist had in course of preparation additional matter, and in course of a few months would be able to prepare a report which would 'show the true life history of the birds and animals of which, at the present time, so many diverse opinions are entertained.' Attention was called to the fact that the value of poultry and eggs annually produced in the State amounted to $22,000,000, and that the loss to the industry by disease and predatory animals amount to $2,500,000, annually. That there was a widespread demand for information on the subjects treated of in the bulletin, and it was stated that if the authority was given to prepare documents on different topics of National history they would be 'embellished' with numerous illustrations. With this knowledge and these recommendations before it, the Legislature, with the approval of the Governor, directed the printing of 15,000 copies of 'Bulletin No. 17' with such additional matter and changes as the author might deem necessary, the form of the resolution being: "Resolved (if the Senate concur). That there shall be printed at the earliest possible date, in pamphlet form, 15,000 copies of Bulletin No. 17, of

the Department of Agriculture, entitled 'The Diseases and Enemies of Poultry, with such additional matter and changes as the authors may deem necessary to more fully explain this important subject.' This resolution was approved on March 9, 1897, and on April following the State Printer received from the Superintendent of Public Printing to proceed with the publication of the work, including an order to 'make type pages smaller and double lead as directed, speciai cover illustrated as directed by the order'." The result was simply astounding, from a pamphlet of less than 200 pages and costing about 11 cents per copy, it had swelled to a bulky paper-bound volume of 866 pages and 103 additional illustrations, costing between $4.00 and $5.00 per copy, or a total cost of $56,000.!

The Governor upon his return from a short visit to the West, was put in possession of the facts and immediatly sent for the Secretary of Agriculture and directed him to discharge from the public service Dr. B. H. Warren, State Zoologist, the auther of this publication, but was informed that he had already resigned and left the State. (Part of the testimony given by ex-Governor Hastings in behalf of ex-Postmaster General Wanamaker, in the collapsed suit for slander brought by ex-Superintendent of Public Printing Robinson last December.)

The Public Printer was compelled to carry the case to the Supreme Court, where he has just received a favorable decision ordering the State to pay his bill as he had done the work "in a satisfactory manner, and apparently, as far as the relator was concerned in a regular and orderly course of business. The Commonwealth got what it had ordered. If the cost was unduly increased it was because unlimited discretion was given to the authors to make changes and additions. The consequences of such loose and inconsiderate legislation may rest where they belong, and not visited upon the contractor, who appears to have acted faithfully." Where this edition has gone I am unable to say as I have seen but a single copy, but is possible that the recipients will find it less profitable than the former well bound editions; and it is safe to predict the Pennsylvania as a State will be chary of booming Ornithological works of any stamp for years to come. The *second scalp act* was more thorough than the *first*. [F. L. B.]

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THE WILSON BULLETIN

No. 35.

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Issued Quarterly by the Wilson Ornithological Chapter of the Agassiz Association

GENERAL NOTES.

EDITED BY FRANK L. BURNS.

Subscription 50 cents a year.

Berwyn, Penna., May 30, 1901.

Entered in the Postoffice at Berwyn as Second Class Mail matter.

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THE WILSON ORNITHOLOGICAL SOCIETY

March 1985

ON THE OCCURENCE OF TWO SOUTHERN BIRDS IN VA.

Virginia offers many conditions from a geographical standpoint which make it a state well favored with an extensive and somewhat varied avifauna. On the West, the Alleghanies, stretching from a northward to a southward direction, afford the conditions for the Alleghanian and Canadian faunae, while on the East, along the Atlantic sea-board as far as the Chesapeake bay, the Austroriparian life area, semi-tropical in its nature, gives rise to a fauna markedly peculiar as regards Mammals—some being of distinctly tropical genera—and containing some peculiar species of birds, as Swainson's Warbler. Throughout the remainder of the state the Carolinian fauna is present, and in certain sections one may find birds of several faunae mingling together. In Southwest Virginia in the Piedmont section I have observed birds of the cold temperate subregion fauna present in abundance,—as, *Dendroica castanea, D. virens, D. blackburiae, Trolodytes hiemalis, Turdus a pallasi, D. tigrina, Certhia f. american, Helminthrophila ruficappila, Junco hyemalis carolinensis*, and others, while birds of the Humid Warm Temperate faunae, were also present in great numbers and breeding, so that there were characteristic birds of three life zones present in the same locality,—birds of the Canadian, Alleghanian and Carolinan faunae all associating together in the same immediate territory. This was at Lynchburg, a locality that seems to be a merging point of the Alleghanian and Carolinian zones. At this same locality, later in the season, the Ground Dove and Bachman's Sparrow have been taken, the latter breeding. The Alleghanian zone has been considered by Dr. Allen as a transition belt LIMITING THE

NORTHERMOST RANGE OF MANY Southern species and the extent of the Southern range of many Northern species; hence the mentioned locality being of an Alleghanian X Carolinian nature, accounts for the protracted presence of these two Southern forms, and is probably the northermost point of their regular range, inasmuch as the chain of the Blue Ridge Mountains stretches from North to South, only a few miles from this locality, and these birds no doubt arrive from a Southeasterly direction and find their futher progress toward West and North barred by the mountain ranges.

JOHN W. DANIEL, JR., *Lynchburg, Va.*

HELMINTHOPHILA PINUS IN WISCONSIN.

The Blue-winged Warbler has always been considered a *very* rare bird in Wisconsin, as indeed it probably is, and so it was with a greal deal of pleasure that I found myself on July 11, 1897, while pushing my way through the edge of a deep second growth oak wood, with an entire family of them before me—parents and four or five young. They were busy feeding among the lower branches of the small, thickly growing young oaks, remaining in company like a family of young Redstarts and gathering their food entirely from the under sides of the leaves, hanging head downward a large share of the time; full fledged at this early date and only showing his immaturity by the indistinctness of the orbital stripe, the paler yellow crown and the general pin-feathered condition of the post-juvenile moult.

They had without doubt been reared in this very wood and it was with considerable eagerness that I watched for their possible arrival the following spring, but although I fairly haunted these and nearby woods the entire season, but one was noted—a fine male, killed before I realized what it was, while collecting Warblers on May 22.

I could not however give them up and the spring of 1899 found me early in these same woods—where on May 14 I came upon a Blue-wing and at the same instant saw the tell-tale grass

in its mouth that certainly indicated nest building. I had mistrusted from the young of two years before that they must nest very early but I had hardly expected to find them building when the bulk of the Warblers had only just arrived and many, strictly migratory species in our vicinity, would linger here for two weeks longer. This was not far from the place where the family of young was found in the summer of 1897 and I remained in the vicinity for some time but the bird had seen me and was extremely shy and nervous so I left and later in the day returned, but the steady sprinkle which had continued all day developed into a heavy rain and I was compelled to leave with nothing more gained.

Three days later I returned to the spot, had myself seemly hidden in the hazel brush with not long to wait when the bird returned—again with nesting material in her bill, and after a few anxious "chips" settled directly into a grassy sod in the centre of a small clump of hazel brush. She was there but a second and when she had left I was looking into the nest, almost completed and already containing one egg. Hastily withdrawing, it was not until the 22nd that I visited the birds again, accompanied by an expert in nest photography. The bird was found on the nest, which contained *six* eggs. This one, the female, was taken, the nest photographed and the watch for the mate began. So far but *one* Blue-wing had been seen at the nest at a time although the continued "chip, chip" of the mate, the exact call of the one killed had been heard many times when the female was in sight. In about a half hour he appeared in the immediate vicinity of the nest and at once showed his great nervousness and anxiety at finding us so near—but on picking him up after he was killed imagine my surprise at finding him nothing more or less than a Nashville Warbler (*Helminthophila rubricapilla*. It proved to be a male with enormously developed testes and no one with any experience with nesting birds could doubt for a moment, had they seen the actions of this bird at the nest, that he was any other than the mate of the female Blue-wing, and the male parent to the set of eggs. I believed it the moment I picked him up, but remained until late in the afternoon, until nearly dark for some other to appear, but neither

did I again see a Blue-winged Warbler or even hear a call that could have been either the Blue-wing or Nashville Warbler.

The Nashvilles are rather rare in these woods, indeed although I collected a great deal there during the year I did not meet with another during the spring or entire summer short of five miles from the nest,I particulairly searched in the immediate vicinity of the Blue-wings' nest for them, in order to completely do away with the possibility of there being a Nashvilles' nest in the neighborhood. The nest is composed of dry oak leaves and coarse grass lined with strips of grape bark and an inner lining of fine grasses; but slightly raised from the ground (not more than two inches) in a tussock of grass in the center of a small hazel bush. The cup is very deep, nearly 2 1-2 inches, and only 2 1-4 across at the top. Six eggs seems to be an unusually large clutch for this bird, but one finds so few records of the nesting of the species that it may be more usual than supposed.

I could not help but regret that in my eagerness and anxiety to make positive my identification of what is probably the only record of the nest and eggs of *Helminthophila pinus* in Wisconsin that I had destroyed such possibilities of further interesting hybrids of the species with allied forms, as I am as well satisfied in my own mind that the Nashville Warbler is the male parent of the set as though I had shot him from the nest.

Since then I have taken two more specimens of the Blue-wing in the same county—a male May 28, 1899 and a female May 13, 1900—the latter within twenty rods of where the young were found. Neither of these were apparently breeding yet when taken.

N. HOLLISTER, *Delavan. Wis.*

THE COLD WAVE OF FEBRUARY 1899, IN DeKALB COUNTY, GEORGIA.

Having received a few enquiries regarding the cold wave of of 1899, and its effect upon bird life in this locality, I have decided to place before the readers of the BULLETIN the results of my observation.

Feb.

On Sunday the 12th at 6 A. M. the mercury had fallen from 30 degrees of the night before, to ten degrees above zero. During the night of the 11th there was a fall of snow, covering the ground to the depth of three inches. This continued with a few scattering flakes till 3 P. M. of the 12th when a high wind arose turning into a lilliputian blizzard, making the snow almost blinding to persons who happened to be exposed to it. There was but little variation in the temperature during the day, there being a rise to 14 degrees at 12 M, with a dropping back again to 10 degrees at 6 P. M. On Monday the 13th at 6 A. M. the mercury registered 12 degrees below zero, slowly climbing to zero at 12 M. rising to 6 degrees above zero at 6 P. M; Fair and calm all day.

On Tuesday the 14th at 6 A. M. the mercury stood at 2 degrees above zero, after which there was a steady rise in the temperature to 26 degrees above zero at 12 M., showing no variation at 6 P. M.

The temperature of the following days was about normal, there being no extreme cold weather experienced; the averaged temperature for the remaining fourteen days of the month at 6 A. M. being 37 degrees above zero.

On the morning of the 12th the rough weather began to show its effect upon the birds. They were driven from the woods to the shelter of barns, sheds or any old place, where they could find protection from the cold. Many of them in these places were wantonly slaughtered by thoughtless boys, who really did not comprehend the enormity of the act they were committing. These were Juncoes, Song Sparrows, White-throated Sparrows, Chipping Sparrows, and Vesper Sparrows.

On the morning of the 14th, about 10 o'clock, I noticed that the birds had abandoned the barn, and other outbuildings belonging to my home, and I immediately started out to find them.

Leaving the public road which passes directly in front of my house, I turned into a little foot path between two old fields, the remains of an old neglected Cherokee rose hedge forming the dividing line between the fields. This old rose-hedge which had been a much frequented resort for such birds as Song

Sparrows, White-throated Sparrows, and Juncos, was now entirely deserted. Turning from the path, and walking through a small growth of woods, a few Juncos, not more than a half dozen, flew from an old brush heap, which had partly sheltered them from the snow, and lit on a low thorn bush, only a few yards away.

Adjoining these woods is a low marshy field, commonly known here as bottom land, where Indian corn had been cultivated the previous year.

This land had become overgrown with crab, johnson and some other kinds of grasses the names of which I do not know.

At haying time the season was so wet that the grass could not be harvested, so it was left uncut upon the field; thus making a tempting feeding ground for all seed eating birds; but not a bird, not a vestage of a feather was found.

Winding in an irregular manner through the field is a ditch overgrown with briers, sumach, alder, elder, wild grape vines, and other kinds of growth generally found in kindred places. In the eastern side is a small cane brake covering an area of about two acres, while immediately beyond, the ground forms a slight incline or hillside, from which the underbrush has been cleared, making a high open wood.

In making a detour of this spot I failed to see a bird, and although I searched carefully for dead or frozen specimens not a single one did I find.

During the night of the 15th, it began raining, and on the morning of the 16th, the glass showed one fourth of an inch of rain fall, at 6 P. M. the thermometer registered 42 degrees, and though it had been cloudy throughout the day, the snow had melted very fast.

At ten o'clock on the morning of the 17th I heard the plaintive notes of a White-throated Sparrow. In a few moments afterward I saw several of these birds perched among the branches of the plum trees in my orchard. Tramping through the soft ground, and melting snow, I made my way to a swamp a short distance west of my home. Here I counted five Song Sparrows, one Cardinal, and one Towhee. On my return I passed through a low pine thicket where I saw three

Blue Jays. This completed my very weak horizon for the day. After this the birds begun to straggle back, but at least two-thirds of them failed to return, while a total disappearance of the Juncos was noted.

The 21st of the month was warm, pleasant and spring like. Making a tour through the woods upon this date I noticed a decided falling off again of the birds, particularly, those which are known as winter residents. This was no doubt caused by the entire destruction of nearly all plant life, thereby wiping out the food supply and compelling the victims to migrate to more favorable feeding grounds.

Everything in the shape of a leaf or a bird had been killed; the leaves of the cane which remain green throughout our severest winters, had been frozen and dangled like scalded strings from their stems.

The grasses in the swamps, and other moist places, where the birds not only found protection from the weather, but an ample supply of food as well, were lying flat in the mud and water.

It is remarkable that while the cold wave undoubtedly eliminated large numbers of birds, I did not in all my tramps discover a single verification of the fact.

A plausible reason for this might be that the birds foreseeing their coming danger attempted to escape to a better protected locality, many of them in their flight perishing from hunger and exhaustion. This theory is partly substantiated by an article (*Auk*, April 1899, page 197) written upon this subject by Mr. Arthur T. Wayne, of Mount Pleasant, S. C., who says in his article as follows: "To say that Fox Sparrows, and Snow-birds were frozen to death by the *millions*, is not an an exaggerated statement, but a conservative one." "There was a tremendous migration of Fox Sparrows, on Monday 13th, following the coast line of the mainlaind." "The Woodcock arrived in countless thousands." "Prior to their arrival, I had seen but two birds the entire winter." "Tens of thousands were killed by would-be sportsmen, and thousands were frozen to death."

It is reasonable to suppose that these birds were driven to

the coast line by the extreme cold, coming down from th North to Charleston in very large numbers. After reachin that point, and finding no food to nourish them, many died (starvation, while others weakened by exposure to the cold, fe an easy prey to the vandal hands that sought to destroy then

A short time after the occurence of the cold wave, I er deavored to obtain some information regarding it from othe parts of the State.

I am sorry to say that the details were meagre and unsat isfactory. Out of about a dozen letters written, only two wer answered, and these answers came in an indirect manner throug the efforts of a minister of Kirkwood, into whose heart I ha instilled a very weak solution of enthusiasm on birds.

ROBT. WINDSOR SMITH, *Kirkwood, Ga.*

THE REDPOLL ACANTHIS LINARIA IN SOUTH CAROLINA.

I have seen the Redpolls once more. When I was a sm boy, in the days of my box traps and flintlock musket, the with the Chickadees, were among my intimates at the woo house door or over "back of the sandbank" in the colde corner of old cold Massachusetts. A Tree Sparrow or two, Nuthatch or a Blue Jay, about filled the bill for that favor afternoon, as a general thing. The rediculously tame Gro beaks, parroty Crossbills, and skimmering Snowbirds we episodes; our Redpolls and Chicadees quite every day affair

Now all is changed. The snow and the cold, except rare occasions, are things of the past. When they do con along as they did last week, they are merely reminders of tl pleasanter episodes of the past; and the little boreal bird two that gets swept along in the bitter blizzard to find a fe days rest in our sparkling sunshine, I hope, will carry away happy thought of his sojourn about our Barrack Yard in e change for the wholesome pleasure he has given me.

This is a regular bird paradise. We have hot enough at tim for any tropical bird, besides having the fag end of a blizza

every year or so for the accommodation of the other sort. As for food, why bug or bean, fish or fly, can be had at most any time with a minimum search. But my fate is to be aboard ship most all the time, where I see only Gulls and hear the migrants at night. There are, to be sure, certain regular morning and evening callers, but they do not tarry long enough to become individual acquaintances. Just now I am boarding with the marine guard, so I go through the Navy Yard every day and am sure of seeing at least a pair of Mockingbirds and a Loggerhead Shrike or so, everytime. About the wharf sloops the English Sparrow has full possession. Between the bell tower and the marine barrack yard is quite a wide bit of sandy, wind-swept ground, mostly built up by dredging from the bed of the river, A few tufts of ragged unkept grass and some sturdy weeds do not as yet offer an excuse even for covering but just stand where they are and make most of their headway in the lee of the barrack yard fence. Here congregate quite a nice little colony of our winter Sparrows—Savannahs, Songs and Vespers, mostly. In wet weather a Swamp or two, and more rarely a Sharp-tail, from across the road that heads down to the naval hospital, there is salt marsh on that side and the Clapper Rail is supreme.

Coming to the gate the other day—February 23rd—I found a cat in the thickest clump of grass and as she fled from the usual brick bat, for all such cases made and provided, among the little Sparrows that skittered startling out was a lovely Redpoll. I saw him on a move next morning. Now it is warm again and he is off and far away I hope. I thought I saw the cat once since then and when I hove the brick a small goat got up and looked at me leisurely. How old and blind I am getting, I could not tell a goat from a cat and then could not hit it.

W. J. HOXIE, *Beaufort. S. C.*

SPRING HORIZON, NEAR LYNCHBURG, VA.

April 26th, 1901,—Grasshopper Sparrow, Red-headed Woodpecker, Yellow Warbler, Chimney Swift, Barn Swallow,

Purple Martin, Flicker, American Goldfinch, Phœbe, Towhee, Bewick's Wren, Carolina Wren, Mockingbird, Brown Thrasher, Vesper Sparrow, Carolina Chickadee, Golden-crowned Kinglet, Ruby-crowned Kinglet, Blue Jay, Song Sparrow, Savannah Sparrow.

April 27th 1901,—Bachman's Sparrow, Praire Warbler, Pine Warbler, Myrtle Warbler, Blue-grey Gnatcatcher, Cardinal, Black and White Warbler, Rose-breasted Grosbeak.

April 29th, 1901.—Bewick's Wren (a nest of this species was found ready to receive eggs,) Red-eyed Vireo, Wood Thrush, Hermit Thrush, White-throated Sparrow, Oven-bird, Yellow-throated Warbler, House Wren, Spotted Sandpiper, Bank Swallow, Mockingbird (a completed nest of this species was found.)

April 30th, 1901.—Warbling Vireo, Red-eyed Vireo, Blackburnian Warbler, Magnolia Warbler, Cape May Warbler, Maryland Yellow-throat, Orchard Oriole, Nashville Warbler.

May 1st, 1901.—Yellow-breasted Chat, Crested Flycatcher, Belted Kingfisher, Solitary Viree, Great Blue Heron, Rough-winged Swallow, Parula Warbler, Kingbird. Bachman's Sparrow (saw two of these birds at close range, making the second time I have met with the species this season)

May 8th, 1901.—Wilson's Thrush, Ruby-throated Humming bird, Baltimore Oriole, Blue Grosbeak, Chestnut-sided Warbler, Black-throated Green Warbler, Blackpoli Warbler, White-eyed Vireo.

JOHN W. DANIEL, JR., *Lynchburg, Va.*

CARDINAL, CARDINALIS CARDINALIS.

Perhaps to many people the Cardinal while not a rare bird by any means is not met with frequently in a walk, because of its retiring nature. When singing from some conspicious branch above the thicket it will send its clear ringing whistle that can be heard for quite a distance.

Near Bristol are five diflerent localities where the Cardinal can be met with at any time, while at two of the five can be seen both male and female.

A large swamp which begins at Bristol and extends for

about five miles back in the county in a North East direction, is a favorite locality for them and they can be found at different places along the swamp. None of the places are further than four miles in a straight line while one pair breeds in a swampy thicket on the outskirts of the town, a most unfavorable locality as it is bordered by a large Woolen Mill and the Railroad. The other four places are further in the country and are very secluded.

With a pair of Field Glasses the Cardinal can be seen at a great distance in winter, and recognized at once by his brilliant plumage and crest. If he thinks he is unobserved he will sing his melodious whistle with some notes not unliko the Carolina Wren and Crested Tit, a strange coincidence of three birds being so similar in range, voice and habits.

Although no nests have been found of the Cardinal around here, I am certain that it does breed.

In spring and summer when the birds are abundant, the Cardinal while noted on a walk is apt to be slighted for the other birds which are around in such profusion. Whereas in winter when the other birds are few and far between, the Cardinal has to be seen to be appreciated, when his brilliant color against the white background makes a picture not easily forgotten.

THOMAS D. KEIM, *Bristol, Penna.*

THREE DAYS WITH THE WARBLER.

Ever since I became acquainted with the nesting habits of our local Warblers, an almost irresistable impulse annually leads me to familiar woods, swamps and old pastures, if only for a few hours stolen from more important duties, to ascertain if our representatives of this interesting family have once more returned to their old breeding grounds. If by chance the ground has been burned over or cleared by means of the knife or ax, I am much cast down and again correspondingly elated if a hitherto vacant fence corner or bit of wooded hillside be tenanted. Late in the morning of the 27th of May, in a reconnoitering mood, I took a walk to the nearest wooded hill-

side. Failing to locate the nesting place of a pair of Worm-eating Warblers in the Oak Bottom, although they were chipping about an excellent place for a nest, I next searched the Black Swan Patch for the Blue-wing Warbler without success. Just back of this half acre on a wooded hillside facing east, I located a Worm-eater's completed nest. I twas under huckleberry sprouts close to path. A pair of birds have nested within a radius of less than fifty yards on this hillside ever since 1895 to my knowledge. This nest contained five eggs of the owner and one of the Cowbird by June 3rd. At the foot of the same hill, between the creek and public road, I heard a slight rustle in the leaves and observed a Kentucky Warbler steal away from her nest at the foot of a spicewood sprout, some yards away. Although in a comparatively clear and open spot, the nest was well hidden. Here again the Cowbird had imposed upon the owner and she had but two eggs.

In the afternoon I watched two or three pairs of Kentucky Warblers for awhile. The ravines above the Iron Ore Hole appeared uninhabited by the Worm-eater, which is not at all surprising. In former years I have known three separate nests to have been built and destroyed in a fortnight. Red squirrels or mice were the probable disturbers. Further down to another small ravine, I almost stepped upon the nest which was under a huckleberry spray. I was looking along the bank which is scarcely four feet high, when I heard a rustle at my left in time to note the Worm-eater trailing up the opposite bank. The location was a puzzle for a momont when I found it at my feet on level ground. It contained five eggs. The Maryland Yellow-throat had her nest in a clump of wild plants at the edge of an oozy bog in the midst of Latch's Swamp. The two eggs were subsequently increased to four. The three pairs of Blue-winged Warblers inhabiting this place eluded me. I doubt not but that many more fledglings are raised in this swamp since I shot the head off of an immense black snake which disputed with me the right to a narrow path. Why is it that almost all creatures destructive to injurious rodents are equally hard on nestlings ?

May 29th seen me in the woods at 6.30 A. M. An appar-

ently thorough search of strips of woods near home failed to reveal Worm-earter's nest, although the male was singing close to hand. Another fruitless search on the steep hillside opposite Laurel Lodge where male was heard singing, took up much of my time. In this overgrown pasture hillside of Beaumont Farm I heard three male Blue-wings singing. While I was ascending path a male hovered over some saplings, some twenty feet below nest as afterwards learned, but flew away on seeing me. Female chipped in a desultary fashion from low bushes immediately surrounding nest which was but ten feet above path. The male pursued another male, and after all was quiet, I flushed the female from her nest and five eggs at the foot of some cherry sprouts and surrounded by blackberry sprouts and grass. The entrance was up hill and away from the path. The female kept within three or four feet of me, and with elevated head feathers, spread tail and drooped wings, chipped loudly. The male kept six or eight feet away. After I had retired a quick chattering series of chips followed. I failed to locate any more here, likewise Kentucky at edge of woods and Worm-eating on hillside opposite, where I had hoped to find the Black and White Warbler nesting.

On down the new road to the Higg's Hollow where I heard another Blue-wing singing away back beyond a field. The roadside looked so near the ideal resting site that I was tempted to investigate. The male came over and sang from a treetop above my head. I soon flushed the plump little female from her four eggs in clump of wild astors, within a foot of the wheel track of the much frequented public thoroughfare. A very close approach on the roadside did not disturb her as she had probably schooled herself to put up with some annoyance on that side. However when startled she proved wild and the mate at once retired to first position. This nest as the first, was made outwardly, of sedgegrass. My movements evidently excited the suspicions of a colored woman residing in a tumbled down log house across the creek, for after a series of halloos which only a full-blooded negro can utter to perfection, and an answering halloo from unseen female drifted down from some little stump lot in the chestnut timber; she whooped " Come

dow-own ! It's *aw-ful* lonely he-re !"

A Yellow-breasted Chat's nest in clump of blackberr bushes, contained a punctured egg, This species will tolerate n interference; to look at the nest often means its desertion afte the destruction of the contents. I was fortunate in discoverin a completed nest of the Kentucky Warbler in middle of aband oned cartroad in the woods overlooking the Valley Baptist Farm The nest was betrayed by birds, in five minutes watching. I was placed at foot of blackberry bush in bunch of growing Span ish needles. Contained four eggs a few days later.

Early in the afternoon I found Ovenbird's nest and fou eggs near the top of the Lithia Spring Hillside. It was unde a huckleberry sprout. Near the Birch Woods I found a rathe deep cupped black rootlet and hair lined nest between oal sprouts at the top of the hill. It looked more liked the worl of the Black and White Warbler than that of any other bird am acquainted with. However it was never occupied, thoug the Black and White remained in the vicinity. Kentucky' and Blue-wings galore but no more nests this afternoon.

May 30th, Decoration Day ! Not many ornithologists mis this as a field day. I made a long search, for the nest of the Blac and White Warbler heard singing on Laurel Hill, but withou success. A nest of Chat found in cedar with single egg of Cow bird, evidence of a broken egg also. Nothing of note until struck abandoned field beyond Cedar Woods. The Blue-win singing from a small tree at a most inviting corner next t Prissy's Hollow. It was overgrown with clumpsof golden rod raspberry bushes, and grass. Female flushed and kept at distance. This species is a hard setter. Five eggs of a ver interesting type in a frail nest very unlike yesterday substant ial structure.

A hard hillside tramp of several hours followed, but n Worm-eaters located, although many heard singing, as well a several Black and White Warblers. The wild song of th Louisiana Water Thrush missed from it last years haunts. A brier surrounded dogwood cratch supported the nest and thre eggs of a Chat.

My most remarkable experience was not in the oological line

ıad stopped a moment to look at the remains of an old cellar, ;htly tapping the sill with a cane. The bottom was heaped up ith small stones, brush, stumps, and tin. Suddenly a head ›pped up followed by the body of an almost full grown Weasel; en another and another until four of these graceful animals ere passing in, out, and around the rubbish, frequently snif- ıg with erect heads in my direction. Evidently they scented arm blood. Presently one of the largest ran up a large stump ıd into the poison ivy at my rear, only to reappear, boldly sniff y heel and nip me in the ankle. A slight movement on my ırt sent it scampering under the bushes for a moment before turning to circle my feet.

Doubtless they would prove formidable enemies if a person as asleep or disabled, and in company with their parents they ust kill a great many rodents, birds, and domestic fowls; still enjoyed witnessing the graceful movements of their sleek ıdies.

On my holiday drawing to a close, I find that my three ıys wanderings were confined to a section a quarter of a mile ide by a mile and half long. Such is the exacting labor of any ıe who follows the Warblers to their homes.

FRANK L. BURNS, *Berwyn, Penna.*

GENERAL NOTES.

A NEW BIRD FOR LORAIN COUNTY, OHIO.—On the 9th of ay, during our 'All Day with the Birds,' Rev. W. L. Daw- ın and the writer happened upon a fine individual of Hooded 'arbler (*Sylvania mitrata.*) The song attracted our attention :once upon entering the edge of the woods, and soon the bird was ıscribed perched upon a small tree some twenty feet from the ound, where it remained until long after we had recorded its song ıd gone on. Later we heard the song again, apparently from ıother individual, since there was an intonation not observed in e song first heard. The bird was in full plumage, the black ıod showing in marked contrast to the yellow of the forehead. › my ear the song was different from that of any recorded

song I have seen. I have represented it thus: *tu wee tu wee te cheu*, the accent being on the second and fourth syllables which seem about a third higher than the short, staccato first and third syllables, the fifth being still higher and short, while last is a rapidly falling inflection. The song was a clear whistling, unmistakable song. The bird sang at intervals of about fifteen seconds during our study of it.

LYNDS JONES, *Oberlin, Ohio.*

PASSENGER PIGEON, *Ectopistes migratorius.*—A small flock of eight or ten Wild Pigeons were seen flying over Beaufort river on the morning of March 18th at ten minutes before 7 o'clock. The birds were about fifty feet up and flying a straight course to the Southeast when I saw them. Two other persons, both of them "old stagers," also observed them, and separately mentioned it to me before I had a chance to tell them.

W. J. HOXIE, *Beaufort, S. C.*

POTTAWATTOMIE NAMES FOR THE AMERICAN CROW, *Corvus americanus.*—I have a valued letter from the late Chief Simon Pokagon, from which I extract the following: Our people in Michigan know almost nothing about the *Awn-dayng* (Crow,) until the white-man came amongst us. Hence we called it the *Wan-be an-ne-ne-g me-che-maw-kaw-te-Pe-nay-shen* (The white man's big pluck bird)." So much for the Crow's dislike of unbroken wilderness, and its boldness in attacking larger and savager birds.

FRANK L. BURNS, *Berwyn, Penna.*

SONG OF THE KENTUCKY WARBLER *Geothlypis formosa*, A CORRECTION.—On page 47 of BULLETIN No. 30, WARBLER SONGS, an unfortunate transposition has occured in the description of the migrant and breeding types of song of this locality. I have heard the song of the supposed migrants from the first arrivals only, on semi-occasional early morning visits to their haunts, and it was soon displaced by the regular breeding song of later arrivals. The first and rarer song should be: *Too-dle too-dle too-dle too-dle*, exactly as described in Chapman's Handbook. The breeding song for this locality is: *peer-ry peer-ry peer-ry*, often *chee chee chee peer-ny peer-ny peer-ny*, delivered in a clear whistle as described by Professor Jones. I have found

that is more often uttered from the ground than above it, having watched it for hours together walking, running and feeding amidst the ferns, mandrake, skunk cabbage and spicewood.

FRANK L. BURNS, *Berwyn, Penna.*

AN OPEN QUSTION.—Is there anything like morality among the birds? Have the birds any genuine sense of obligation where other birds are concerned, or does might make right with them universally? These questions have been chasing each other through my mind of late, and have failed to find an answer. The other day, as I sat in the edge of the woods rather idly watching the tree-tops for the Warblers, the actions of a female Redstart arrested my attention. Instead of feeding it seemed to be peering about in an anxious manner as it gradually ascended from the lower branches of a large oak tree. Some fifty feet up among the branches it stopped in its upward course and circled the tree trunk, always with the same anxious. air. Suddenly it plunged into the midst of a spreading thicket of branches and began working madly at something, which, upon closer inspection, proved to be a half completed nest of a Yellow-throated Vireo. Mrs. Redstart was frantically yanking fibers and cobwebs from the outside of the nest, and soon darted down into the shrubbery with a mouthful of the stolen material for her own nest. I have many times seen birds destroy old nests for the material which was used in making a new one, but in only a few instances have I seen such robbery as this.

LYNDS JONES, *Oberlin, Ohio.*

THE WESTERN GROSBEAK, *Coccothraustus vespertinus montanus*, IN COLORADO.—The evening Grosbeak is referred to in BULLETIN No. 34, as a rare bird. I made its acquantaince (the western form) for the first time this year, and in such numbers as to raise a doubt of its rarity. Walking down a street near Mapleton Hill, Boulder. Colorado, in February, I was startled by the discovery of a dozen of them in a small tree. They were apparently very hungry, searching the tree for food, paying no attention to me, though many of them were within six or eight feet of me. Afterwards I saw them daily for several

weeks, on two more occasions more than 100 at a time, once in West Boulder and again on the court house lawn, in the center of the city. I shall eagerly hope for the return of this interesting bird, which is now deemed a resident of Colorado, having been noted every month in the year.

JUNIUS HENDERSON, *Boulder, Colo.*

SNOWFLAKE, *Plectrophenax vivalis.*—We had a visit this Winter from the Snow Buntings. We first saw them on Thursday, February 14; and the last we saw of them was on Thursday, February 28. Almost every day during those two weeks the beautiful creatures fed on the weeds in front of our house. They would be feeding by sunrise and continue until toward noon when usually they would fly away, returning about three o'clock in the afternoon, when they would continue their musical twittering, which was almost like song, and their feeding until after sunset. Most of this time the weather was cold, the thermometer ranging between five and twenty-five above zero.

They did not seem to mind me except when I would raise my field glass, when they would utter a complaining call, rise a little above the weeds and fly several yards, drop and resume their twittering and feeding. One day when I had followed them up and down the field for some time they seemed to grow impatient, rose with a wheeling undulating flight high over a house, swept across the street and began to sing in a high sweet flute-like tone "*tsi-a-wee-ee-ee.*" Then, still singing, they wheeled again and after hovering silently a moment over the weeds, dropped down upon the snow and went to feeding and chirping.

Another day I heard the song when their spirits were undisturbed. It was on a brilliant day when the snow was just beginning to reflect on the sunset glow. I was crossing the field some distance from where they were feeding when all at once several birds rose from the flock soaring high into the sky and pouring forth such a rhapsody as well fitted the glory of the setting sun. It was so full and sweet that I could only drink in its beauty, I could not analyze it.

MURIEL KINNEY, *Cleveland, Ohio.*

AN ALBINO TOWHEE, *Pipilo erythophthalmus*.—On the 5th of March Mr. John Timmons of South Kirkwood, shot an Albino Towhee and kindly presented me the specimen. The bird was found in company with others of the same species, in a brush heap on newly cleared ground on hillside adjoining a swamp, about one half mile from Kirkwood Station, on the Atlantic Power Electric Car Line. The stomach contained fragments of some minute undetermined coleoptera, two small pieces of acorns, some tips of the seeds of the Tulip tree, or Yellow Popular, as it is commonly called in the South, and a quantity of small white gravel. The condition of the body after the removal of the skin appeared to be normal, with no indications of malformation or desease. Directly under the wings, the neck, entire length of the back, a decided pink tint was appreciable, while the fleshy portion of the breast was the usual color of other birds of the same species; the inside of the gizzard showing the same pink cast of the other parts of the specimen.

Throat, breast and upper part of abdomen, white; a light chestnut brownish cast on lower part of abdomen, and underneath the tail, this color showing on each side of the breast from the bend of the wing, merging into a smoky white on the thighs. Wings a grayish brown with the usual white markings peculiar to the species. Under parts of the tail feathers grayish brown, with white on the lower parts of the inner webs of the first three, the four central feathers white, showing conspicuously from above. Forehead dashed with spots of light chestnut brown, but darker than the brown on the other parts of the specimen. Rest of head and entire upper parts white, with a few light chestnut brown feathers immediately over the rump. Ten feathers in the tail. Bill black—eyes black—feet brown. Length 7,00, wing 3,25, exposed culmen 0.50, Tail 3,25. Measurement in inches before removing skin.

ROBT. WINDSOR SMITH, *Kirkwood. Ga.*

EDITORIAL.

As results and not mere promises are most satisfactory, we can only regret the evidences of careless proof-reading in our last issue, and hope for better results hereafter. A better grade of paper will be used, and with aid of members and subscribers, a magazine more and more worthy of patronage and preservation will be attempted. The many expressions of confidence and encouragement are appreciated. For lack of space in this issue. an article of some length, entitled "All Day with the Birds" by Lynds Jones, is defered until next number. All desiring to contribute articles or items of interest for the August number, are requested to do so at an early date, as tne last number to the volume will probably be a special, devoted to bird census entirely.

Do not neglect to comply with Professor Jones request for migration notes for the dates he names, any season or as many years as possible. It is a disappointment to us also to have so few reply to suggestion appearing in May number, in relation to predominate color phase of Screech Owl. The educational value of looking over and rewritting old and scattered records is not the least of the benefits derived by the amateur ornithologist in co-operation study.

The propensity of the Blue-winged Warbler *Helminthophilv pinus* to form "misalliances, or in other words, to mate with individuals of other closely related species, Is again examplified; this time in connection with the Nashville Warbler, *H. ruficapilla*. The instance related in this issue by Mr. Hollister, is I believe, the only record of crossbreeding by the latter species. With *H. pinus* if has been otherwise. It has been long suppected; and at irregular periods there have appeared accounts in the *Auk* from which one may gather apparently conclusive evidence of its interbreeding with the Golden-winged Warbler *H. chrysoptera*, Brewster's Warbler *H. leucobronchialis*, and probably the Kentucky Warbler *Geothlypis formosa*; Lawrences' Warbler *H. lawrencei* being considered a hybrid or mongrel of the first and the Cincinnati *H. cincinnatiensis* of the last.

Next to taking collecting trips ourselves, we all doubtless enjoy reading of the projected trips and work of others. We give herewith a brief summary of the plans of several of our most active members and would be pleased to hear from the others from time to time.

In addition to a special and exacting work on bird census which he has undertaken, Mr. Benj. T. Gault is preparing a list of trees and shrubs of the county to be used in connection with the forthcoming "Flora of Chicago and Vicinity" by Prof. Highley of the Chicago Academy of Sciences, Lt. John W. Daniels, Jr. proposes to spend a few weeks in the Blue Ridge mountains to investigate the summer birds of the Peaks of Otter (4000 feet) region. This section has never been investigated by an ornithologist, and many species of the Canadian fauna may be looked for as summer residents and breeders. Mr. Robert Windsor Smith is already hard at work on a sectional bird census about his home in Georgia. We may look for an interesting report in which he will doubtless treat the subject in his usual thorough manner.

President R. M. Strong is about completing a postgraduate course at Harvard University where he has done a great deal of biological work. With increasing leasure we hope to hear of him in the field once more. Of Professor Lynds Jones, we can truly say that he is always busy, for in addition to instructing a class of over sixty students in ornithology, and other regular college work, he finds time to take almost daily horizons and incidently add to his knowledge of the birds of Lorain county. Ohio. It is confidently predicted that a few more seasons of such persistent labor will enable him to pretty accurately "guess" the feathered population summering, as well as wintering, in that county.

A SUGGESTION FOR WORK.

When our study of the birds has carried us beyond the period of merely learning to recognize the different species, we begin to look about for something more to learn. Naturally the

next thing is to become familiar with the life of the bird by personal acquaintance. Clearly the only way to do this is to get among the birds where they live. They soon become fellow beings to us, in their daily life showing most of the human characteristics. Few of us can hope ever to know the individual birds apart, but all of us can enter, in greater or less measure, into acquaintance with many individuals about us while they are rearing their young.

There is no better way to become familiar with the birds than to pursue a course of study that will keep the birds before us every day, if possible several times a week at least. This sort of study need not be one which necessarily consumes much time, but may be planned to occupy all or but part of one's daily leisure or time for recreation. But this leisure time, if it is to count for much, must be definitely planned. Something will be accomplished if we aim at the most general and cursory notice of what birds are seen, but with a definite plan in mind the result will be far greater and withe greater expenditure of energy. One good definite plan may be the making of a census for some limited area. Few of us are so closely hedged about that there is not some small area which can be compassed successfully with but little effort. Let me make a few suggestions about census taking.

In the first place, a carefully made census of a known area, however small, for a definite limited time when there will be no change in the bird population, will furnish a fairly exact basis for comparison in the years to come when we need to know whether or not the birds are decreasing and at what rate. It will also furnish a basis for estimating the whole bird populaiation for a large number of similar areas. In the second place, it will furnish the basis for determining what changes, if any, may be brought about it the habits of birds due to environment where the conditions are constantly changing. In the third place it will furnish us with a definite purpose for our work, and so give to the work a greater interest, and in this way keep us alive to many other things than the census which are sure to pass in review before us. They are surprises for the most advanced ornithologist when he least expects them. In the

ourth place, when many persons have completed a census in nany different places and under many different conditions, we hall have an excellent basis for determining the bird population for large regions of country, if not finally for the whole ountry. And this determination, which has never yet been ttempted even approximately for even a single species, will ell us, broadly, what may be the fluctuations in the bird population as the years pass. With all this will naturally go the letermination of the causes of decrease, where there may be iny, and the best methods of encouraging an increase where it nay be advisable.

I have several times before urged the need for such work iow before primitive conditions have wholly, passed away, beore the advance of the irresistable tide of human changes, and wish to urge again, with all the earnestness at command, enering upon this line of work at once. None of us are so iedged about by other duties but a little time can be devoted o census taking for some small area, and now, while so many of the birds are occupied with family cares, and are consequently at home', is the time to begin the work. Let the first attempt be in your own door-yard, if you prefer, only let it begin. You will be ready for a larger field when you have finished that, and you will then be better able to plan what you have to do. Let your work include only those birds which have a nest in the chosen area, counting two for each nest, of course. If a pair of birds probably have a nest in the area, but you are unable to find it, these may be counted also.

You may be in search of an area larger than the door yard. If so, the more representative one you can select the better. The ideal area would be one which included a little of every sort of country in the region. Let me caution you not to be too ambitious in the selection of an area. Let it be small enough so there will be no possible question of your covering it in a reasonable time before it becomes an irksome task. You most not let you recreation become a wearing burden.

Again let me caution you to be careful what birds you record in this census. Not every bird that sings on your chosen plot can be considered a resident of it, but a little attention will

tell you what birds should be counted as residents. You want no 'Floaters' in your count, for they belong somewhere else and would then be counted twice. If young birds of the year are counted they should be designated as young.

There is no need to complete the census in a single day, nor in a week, if care be taken to avoid duplicating records. A little practice will enable you to carry on the work at odd times successfully. You need only to keep a careful record of all work.

When your work is completed, if you will send it, with a specific description of the area chosen, with your name and address, to the address below, it will be incorporated in a general report of work done in many different places with the deductions that may be possible.

LYNDS JONES, *Oberlin, Ohio.*

FURTHER SUGGESTIONS FOR THE TAKING OF A BIRD CENSUS.

In the above communication, Professor Jones impresses upon our minds the importance of general utility of any well taken bird census; he also offers many valuable suggestions as to the mode of procedure, and a few words of caution; valuable to any one who may decide to take up this novel and all-absorbing branch of field work.

The writer has been engaged in the enumeration of the avian population of a stated district for several years past. The outline of the work he has blocked out, may prove of interest to many, as it fills out in a measure the details omitted by Professor Jones. A correspondent has remarked that it necessitates scarcely less than a biological survey of the section studied, but it is not intended to be strictly so, only the most numerous and familiar plant and animal life havingan important bearing upon the presence, obsence, increase or decrease of our birds need be taken into consideration.

1st. Map out a tract of land one square mile (640 acres) most readily accessible and if possible containing a fair proportion

and representation of the flora and fauna with the natural surroundings (upland, swamp, creek, ravine, wood, thicket, clearing, meadow, cultivated field, neglected field, orchard, lawn, etc.) of the neighborhood or county. Where it is fouud impossible to unite so diversified an area, separate sections may be mapped out in proportionate blocks.

2nd. Description of the topography of section studied. The altitude, latitude and longitude. Mean and extremes of temperature for the breeding season. Humidity, etc.

3rd. Enumeration of the characteristic plants, fruits, grain, nuts, insects, fish, reptiles, mammals, etc., indigenous to district, also those introduced by man directly or indirectly, which may be regarded as foods, enimies or competitors of the birds, and which according to their scarcity or abundance might effect the increase or decrease of the avian inhabitants.

4th. Presence or absence of natural or artificial nesting sites, shelter or cover, in connection with the numerical abundance of certain species of birds.

5th. Enumeration of the number of individuals of all species of birds summering or breeding within the specified limits, by means of "horizons", song of males, the location of nests, and any other way possible; verifying records by a careful search for nests after the leaves have fallen, not losing sight of the fact that some species build two or more nests in one season.

FRANK L. BURNS, *Berwyn, Penna.*

MIGRATION NOTES WANTED.

Last year I called for migration records for early May, but the responses were so few that no table for the bird movements of the first five days could be prepared, I again make the call for migration records for the first five days of May, and earnestly solicit the records of a every reader of this notice. The records of a single year will be acceptable, but I desire such records of as many years as can be given. I particularly wish records of "first seen," but "next seen" and "common" would also be very acceptable.

Address, LYNDS JONES, *Oberlin, Ohio.*

and entered upon its second decade of usefulness. Such well known ornithologists as Witmer Stone, Samuel N. Rhoads, Thomas H. Montgomery, Jr., Charles J. Pennock, George Spencer Morris, William E. Hughes, and others, are numbered in active membership; and like the esteemed A. O. U. is well balanced by a long list of associates. The Club is doing good work in keeping alive the interest in local ornithology and preserving many of the most important Pennsylvania and New Jersey record. No. III contains a summary of the proceedings for the years 1898 and 1899. This pamphlet of 28 pages is brimful of interesting notes and records. Many of the members have had more than local experience as collectors, which together with the local news and observations, and the almost inexhaustible collections of the Academy to draw upon; serve to make the meetings a great source of pleasure and profit to those of regular attendance. To hear the personal experiences of ornithologists but recently returned from Yucatan, Greenland, Alaska, and other remote places, adds the larger measure of reality so often lacking in a printed page. Edward A. McIlhenny's account of the nesting of the Snowy Owl at Point Barrow, Northern Alaska (as many as sixty nests being found in one day) is of peculiar interest. The following papers have been revised and published in full: "Birds of the Blizzard of February 1899." "Migration Data on City Hall Tower." "Summer Birds of the Higher Parts of Sullivan and Wyoming Counties, Pa." No. IV is for the year 1900. We note among the dates and localities of the more important records, the addition of the Chestnut-sided Warbler, *Dendroica pensylvanica*, to the list of breeders in Chester County, Penna., by the well known oologist, Samuel B. Lodd. The following papers are given intact: "Some Observations on the Habits of Crossbills (*Loxia C. minor*) Observed at Hanover, N. J., May 4-6, 1900." "Recent Capture of Ivory-billed Woodpeckers (*Campephilus principalis*) in Florida." "Bird Language an Index of Family Relationship." Outside of the peculiar medley produced by the careless use and disuse of capitals in the common names of birds, in one of the articles; this pamphlet is equal to its predecessor in neatness.

[F. L. B.]

WANTED

Avi-Fauna, No. 1. **Audobon Magazine**, Vol. I, No. 1.

American Naturalist,, Numbers containing articles commencing on given pages: '85, p. 407; '86, p. 691 and 777; '97, p. 622, 812 and 907.

Bulletin Cooper Ornithological Club; No. 3.

Maine Ornithologist, Vol. II, No. 1. **Loon**, No. 1.

Iowa Ornithologist, Vol. IV.

Oologist, No. 158, all Vol. XVII.

Michigan Ornithological Club Bulletin, No. 1, Vol. I.

Journal Maine Ornithological Society, all except Nos. 1 and 3

Observer, vol. I, Nos. 4-12; vol. II, all; vol. III, all but No. 5, vol. IV, all; vol. VII, Nos. 1, 3, 11 and 12; vol. VIII, Nos. 3-7, 9-12.

Old Curiosity Shop, vol. VII, Nos. 2 and 12.

Oregon Naturalist, vol. IV, No. 6 and after 7.

Ornithologist and Botonist, vol. II, Nos. 3-5, 6.

Oologist, (Utica, N. Y.) vol. I to V, ['75 to '80].

Western Ornithologist, No. 3.

Forest and Stream, vol. XIII, p. 1024; vol. XIV, p. 6 and 25.

2d Annual Report of the New York Zoological Society

Pennsylvania Agricultural Report, '83, and many others.

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Old Series, Vol. XIII. New Series, Vol. VIII, No. 3.

THE WILSON BULLETIN

No. 36.

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AUG 13 1986

Issued Quarterly by the Wilson Ornithological Chapter of the Agassiz Association

GENERAL NOTES.

EDITED BY FRANK L. BURNS

Subscription 50 cents a year

Berwyn, Penna., August 31, 1901

Entered in the Postoffice at Berwyn as Second Class Mail Matter.

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THE WILSON ORNITHOLOGICAL SOCIETY

January 1980

ALL DAY WITH THE BIRDS.

This is to record the third attempt to find the best day of all the year for the birds in Lorain County, Ohio. Our first all-day horizon was for May 17, 1898, with a list of 102 species; our second, May 8, 1899, 112 species. Two attempts at an all-day horizon were made in 1900, May 5 with a list of 93; May 19 with a list of 100; but these were so far below the previous records that they have not been counted seriously with the others. Besides, Rev. W. L. Dawson and the writer have been the participants in the 1898, 1899 and 1901 records, and these should be compared rather than last year if the work is to be on the same footing.

The greatest drawback to a work of this character is the inability of persons situated as we are to take advantage of the most favorable day. On the contrary, May 9th was decided upon as the day for this piece of work at Christmas time—four months previously—because that was the only time when both could leave our work. But such disappointments serve only to whet our appetites for the years to come. It is the large record on an unfavorable day which furnished the excitement of the chase. But there were other considerations which made the day close at 2.30 P. M., so that the present horizon is scarcely more than half a day long.

We were in the field at 4 A. M., pushing out to the woods which has yielded up so many rare species. A thick fog threw a shroud over everything beyond a hundred feet, saturating the grass and foliage. The season was so backward that none but the soft-wood trees had ventured to put forth leaves, thus affording an unobstructed view into the tree tops. By 7 o'clock the fog had risen into fleecy clouds and the temperature risen from

56 degrees at the start to near 70 degrees. Bird voices filled every cubic centimeter of air, and our spirits and hopes rose accordingly. Just in the edge of the woods an unknown song occupied our attention for full fifteen minutes, until the singer gave us a full view of his yellow body and shining black hood—Hooded Warbler. He is the first of his species for both of us, and an addition to the county list. In another part of the woods we stumbled upon a pair of the rare Golden-winged Warbler, apparently in search of a dwelling place. While we were at breakfast another Golden-wing sang for us from a bush hard by.

At 8 o'clock we left the woods and pushed on for the lake shore and its swamps, picking up several species by the way. While there were surprises in the appearance of some species which we had not reason to expect, there were also disappointments in the absence of many which there was every reason to expect, so that the outcome of the day's work was in considerable doubt. The way some unusual species had of coming out to show themselves at just the right time for us to record them became not simply encouraging but even amusing. No doubt the foggy morning had something to do with that condition.

At the lake shore the American Herring Gull was the only bird to be seen which might not have been found elsewhere; but the swamps graciously yielded a plentiful crop of interesting species. During lunch our list grew amazingly. The birds seemed to focus their attention upon us in spite of ourselves. There can scarcely be a doubt that several more species would have been seen here if there had been time to beat about for an hour or two longer. The field was by no means exhausted when the hour for returning came. But in spite of the limitations the list numbered 109 species for the day's work, falling but three below the best record.

A scrutiny of the appended list will show that of the 109 species but eleven are water birds, and of the eleven only five were seen outside of the distinctively Oberlin fauna. The list includes seven birds of prey, four out of the six woodpeckers, seven flycatchers, but thirteen sparrows, but four of the six swallows, all four vireos, twenty-one warblers, and all but one of the thrushes.

Of the species recorded on May 8, 1899, 20 were not seen this year, and therefore seventeen recorded this year were not seen in 1899. It is interesting to notice that this difference of species lies almost wholly in the unusual species and that the difference in the seasons seems to have little effect. This list is smaller chiefly because less time could be given to the work, not because some of the later migrants had not yet arrived. The species which are common to all three of the years number 88. Starting with this number for a basis one might reasonably expect to record more than a hundred species on any day between the 5th and 20th of May, assuming favorable weather.

In the absence of actual experiment to prove it, one may not be allowed to say that any untried day was a better day for birds than those tried, but judging from appearances and from the appearance of fields and woods on May 18th, I would say that that was the most favorable day of the year. It was not possible for me to prove it, however. The later migrants were just in and the north bound ones which had come earlier were still with us. What the probabilities for the unusual species would have been only actual field work could demonstrate.

It is true that we have exploited this "All Day" May day far more than any other "All Day" of the year, chiefly because there is a certain interest which attaches to the largest horizon, but the reader is not to conclude from this that our attention is focused upon this May day work. The horizon taking continues during the whole year so far as other duties will permit. When sufficient material has been collected it is proposed to tabulate the results of this work with a view to determining the status of the bird population for each week of the migration periods and for each month during which there is little or no change in the bird population. What other deductions may follow from this work time will show.

In the list which follows the species which were common on the 9th have a C following the name. These followed by a number indicate the number of individuals seen during the day :

Pied-billed Grebe, 1.
Am. Herring Gull.
Am. Bittern, 1.
Green Heron, 1.
Virginia Rail, 1.
Sora, 1.
Am. Woodcock, 1.
Solitary Sandpiper, 1.
Bartramian Sandpiper, 1.
Spotted Sandpiper.
Killdeer, c.
Bob-white.
Mourning Dove, c.
Sharp-shinned Hawk, 2.
Red-tailed Hawk, 1.
Red-shouldered Hawk, 1.
Broad-winged Hawk, 1.
Am. Sparrow Hawk.
Barred Owl, 1.
Screech Owl, 1.
Belted Kingfisher.
Hairy Woodpecker.
Downy Woodpecker.
Red-headed Woodpecker, c.
Flicker, c.
Whippoorwill, 1.
Nighthawk, 1.
Chimney Swift, c.
Ruby-throated Humming Bird, 1.
Kingbird.
Crested Flycatcher.
Phoebe.
Wood Pewee.
Green-crested Flycatcher.
Traill's Flycatcher, 2.
Least Flycatcher.
Prairie Horned Lark.
Blue Jay, c.
Am. Crow, c.
Bobolink, c.
Cowbird, c.
Red-winged Blackbird, c.
Meadowlark, c.
Orchard Oriole.
Baltimore Oriole, c.
Rusty Blackbird, 2.
Bronzed Grackle. 2.
Am. Goldfinch, c.
Vesper Sparrow, c.
Grasshopper Sparrow.
White-crowned Sparrow.
White-throated Sparrow.
Chipping Sparrow, c.
Field Sparrow, c.
Song Sparrow, c.
Swamp Sparrow.
Towhee.
Cardinal.
Rose-breasted Grosbeak, 1.
Indigo Bunting.
Scarlet Tanager, c.
Purple Martin.
Barn Swallow, c.
Bank Swallow.
Rough-winged Sparrow.
Migrant Shrike.
Red-eyed Vireo, c.
Warbling Vireo, c.
Yellow-throated Vireo.
Blue-headed Vireo.
Black and white Warbler.
Blue-winged Warbler.
Golden-winged Warbler, 3.
Nashville Warbler, c.
Tennessee Warbler.
Orange-crowned Warbler, 3.

Yellow Warbler, c.
Magnolia Warbler.
Myrtle Warbler.
Cerulean Warbler, c.
Chestnut-sided Warbler.
Blackburnian Warbler.
Palm Warbler, 1.
Oven-bird, c.
Water-Thrush.
Louisiana Water-Thrush, 1.
Mourning Warbler, 1.
Hooded Warbler, 2.
Maryland Yellow-throat, c.
Yellow-breasted Chat.
Am. Redstart, c.
Am. Pipit.
Catbird, c.
Brown Thrasher, c.
House Wren, c.
Long-billed Marsh Wren.
Brown Creeper, 1.
White-breasted Nuthatch.
Red-breasted Nuthatch.
Tufted Titmouse.
Chickadee.
Golden-crowned Kinglet.
Ruby-crowned Kinglet.
Blue-gray Gnatcatcher.
Wood Thrush, c.
Wilson's Thrush.
Olive-backed Thrush.
Robin, c.
Bluebird.

LYNDS JONES, *Oberlin, Ohio.*

The Passing of the Bird.

Much has been written bearing upon the extermination of birds for millinery purposes, the mantle of censure falling upon the plume hunter, "regardless of race, color, or previous condition of servitude." Journals with ornithological aspirations, and some with no aspirations at all, have taken up the cudgel with a hard set determination of eliminating the plume hunter, and the sweet young creature who decorates her hat with his ill-gotten gains. The fact, however, is overlooked that Dame Fashion, that fickle old goddess who, from time immemoral, has sat upon her throne of beauty and ruled the world, places the mark for the feminine eye. Until she issues her imperial ukase that the persecution of the bird must cease, it will be painfully in evidence upon the hat, while the plume hunter will ply his "nefarious" calling, unmindful of the ill aimed arrows of his bird-loving enemies.

The large hearted sportsman with a prospective "shoot"

in view, appeals to a slugglish legislature in behalf of the birds, while the fair contingent of some Audubon Society touches the susceptible heart of some blond-haired member with a prayer for her feathered friends.

At the last session of the Georgia Legislature (November, 1900), a bill was introduced for the protection of singing birds, but it met an untoward fate, and its head dropped into the basket of the executioner.

The term "singing bird" was misleading, and its definition too ponderous for the average mind of Georgia's most august body, over which the shade of Daniel Webster had never fallen. Some of the members voted against the bill, claiming that the title "singing bird" was not complete in its meaning, that some birds might be killed through ignorance, without any intentional violation of the law. A compromise was made, however, and a bill passed for the protection of Mockingbirds.

How well this law is being enforced can be better understood by listening to the familiar chirp of the young Mocker whose cage hangs in front of most any Italian's fruit stand in Atlanta.

The honesty of purpose of the many young women who have championed the cause of the birds cannot be too highly commended, but they, like their male admirers, are carrying their war of "protection" too far in one direction.. Occasionally one finds an article in a magazine or newspaper touching upon the devastation of our forests, and without any undue display of sentiment the writer pleads for the preservation of the trees. One does not have to look very far ahead to see in the destruction of these grand old landmarks the gradual but certain extermination of the birds. I have been thoroughly convinced that the clearing of the large tracts of timbered lands and the draining of marshes and other low places, has had a marked tendency towards driving the birds from their former haunts and feeding grounds. The reaching out in all directions of our extensive system of trolley lines from the cities to the country beyond, thereby increasing the population as well as enlarging the area of every surburban town, has played no insignificant part in the "great drama" of bird life.

In my immediate surrounding the baleful influence of the plume hunter has not been felt, and it never has been my ill fortune to meet one of those much abused and much written about gentlemen.

There is no doubt that surf and shore birds have suffered greatly from the depredations of the plume hunter; the Gulls and the Terns adding largely to the victims of his deadly gun. But in inland districts, remote from water courses and the sea, where the birds are seldom taken for the millinery trade, their unmistakable decrease in numbers must be attributed to something else.

In eighteen hundred and forty-eight my father moved from Key West, Florida to Atlanta, Georgia. The place was then a little country town, and the spot upon which our home was built, was virtually in the wilderness. The Bob White, or Partridge, as it was commonly called, was a familiar bird, and plentifully found anywhere in the woods. They were not often disturbed, for the sturdy old farmer in those days would have considered it defamation of character to point his long squirrel rifle at such small game as a Partridge.

Soon Atlanta outgrew her swaddling clothes, and the far reaching hand of progressive man began to remodel the plan of the little village and in time her barren fields and red clay hills were hidden by the towering walls of a great city. The modern breech loader, and the well trained dog appeared upon the scene and the Bob White like the wandering Arab folded his tent and stole silently away.

In this Southern country before the civil war, when land and labor were both plentiful and cheap, it was a common custom with the farmer in prepairing his "new ground" to girdle the trees and leave them standing upon the land.

The fields after being cultivated or "skinned" for four or five years, were "turned out" to become a tangle of weeds or briars. These old fields were always a kind of preempted claim of the Bob White, while the dead trees above them were perforated with the holes of the Red-headed Woodpecker, and Flicker, the Bluebird coming in as a social adjunct to the rest of the family.

It would be more than a day's tramp from any of our large Southern towns, to one of those "turned-out" fields now, and the adventurous pilgrim who undertook the tour, would return to his wigwam more hungry than wise.

Sixteen miles east from Atlanta and directly on the line of the Georgia Railroad, stands Stone Mountain, at which place is located the plant of a granite industry. Before these works were erected, the spot was a perfect wilderness of red cedar, and yellow jessamine. It afforded a roosting. as well as a nesting place for the Turkey Vulture, while the shrubbery which covered the mountain, provided an ample shelter for smaller birds to nest and rear their young. Not a feather can now be found upon that mountain, every vestage of plant life has been wiped from that time-honored spot and to day it stands a bare rock reaching above the clouds, a sad reminder of its former grandeur. There is another bird which must not remain unsung. it would be downright treachery, like selling my Southern birthright,to forget the bird of my youth—the Purple Martin. I often think of that tall pole with the many gourds tied to it, which "Uncle Tom,"our old black daddy had planted behind his "quarters", just between the horse lot, and the plum orchard, for the accommodation of the Martins. There was always a sacred tie between an old time darkey and the Martins; he never neglected to provide for their comfort, and the birds came and went without an unkind "fling" from their black benefactor.

A Martin pole would be a "rare find," now, and the Martins? I sometimes see a few sailing overhead, and I often wonder where they build their nests. Once or twice I have put up boxes for their use, but the English Sparrows have always taken possession of them before the Martins arrived.

The old time darkey, one of the finest friends that these birds ever possessed, has already reached the turn in the road to the Darksome Valley, and will soon pass into the shadows of the "Great Beyond." I know not that when the work of life's eventful day is done, that the storm tossed mariner will see the celestial beacon of a better world. But if there is a

reward for the faithful toiler in the master's vineyard, then that old servant as he bows heavy laden before the throne, will lose his burden, and passing through "the gates ajar" will wake in the dawn of a brighter day. In many of our institutions of learning, arbor day has been incorporated into the course of study, and every year upon a certain day, trees are planted, and the necessity of preserving them is instilled into the mind of the student. A few days ago I read an article in the *Atlanta Daily Journal* commenting upon a recent visit of Secretary of Agriculture Wilson to Mount Mitchell, North Carolina, "the highest peak east of the Rockies." The Secretary criticised severely the denuding of the forest for "commercial and mistaken agriculturial purposes," and complimented the effort to obtain from the Government an appropriation for a forest reserve. Mr. Wilson made the startling disclosure that while the north and the west had more than 70,000,000 acres of forest reserve, the south had none. But one move begets another, and the day is not far distant when the trees, as well as the birds will be better protected in this Southern land. North Carolina though the first Southern State to forge to the front will find others as energetic as she, that will follow closely in her wake.

It is a noble undertaking for some tree and bird-loving spirit, though a tedious journey over a rough unbeaten path, and one upon which few foot prints have yet been made.

ROBT. WINDSOR SMITH, *Kirkwood, Georgia.*

A Late September Horizon at Cairo, Ills., Including a Brief Visit to "The Point."

While visiting in the Southern Section of the state last fall, it was the writer's privilege to spend a single hour on "The Point."

To those who are unfamiliar with the topography of Illinois, let it be stated that the above expression applies strictly to that low flat, alluvial tract of land, situated at the junction of the Ohio and Mississippi rivers, and extending southeasterly

from Cairo for a mile or more. It is the southernmost point reachable in our State.

Its peculiar position renders it unique in some respects, situated, as it is, at the sharp angular meeting place of two great rivers, as well as migration thoroughfares, which latter fact alone would readily suggest to our minds interesting possibilities in the way of birds.

This statement doubtless would hold true of it during the height of the season of migration and otherwise, perhaps, if a much longer time could have been given to it as a locality.

But, as it was, my investigations failed to yield the hoped for results and withal were somewhat disappointing. So, therefore, what little value there is in these notes really has more to do with what was not seen than what was actually recorded. Elimination, in this instant cuts something of a figure.

Still, after all, a hurried inspection of any given locality, however promising at first sight, with worked out results that afterward are uncompromisingly poor, as they almost proved to be in this case, is hardly a fit test of its actual capabilities at all times.

It is so here at home, one day ever varying with another, and consequently why should it not be so in places with which we are less familiar? Then again, as all of us, are equally aware, and who have given much attention to the movements of birds, the hours of the day have everything to do in the determination of important results.

Arriving at Cairo on the evening of September 28, it was learned with regret that no convenient connection with the north bound train over the "Big Four" could be made until 3 P. M. of the day following. So, to improve the spare time, thus thrown upon my hands a number of Cairo bird-horizons were proposed, and, among other places, "The Point," as it is locally called, was selected to be visited. During the night we experienced a heavy shower and although subsiding, it had left its threatening effects in the sky when the morning came on. I had seen one flock of Ducks and another of Geese (?) going southward during the early A. M., over Ohio, and had heard the clear-cut notes of the Carolina Wren in the little park fac-

ing the Halliday House. The outlook seemed in a measure promising.

But, sadly enough, the rain came down again, serving well in dampening my budding spirits, as well as very conscientiously holding me in check for the balance of the forenoon—the result being that the greater part or my plans were forced to be abandoned. But the bottom-lands, heretofore alluded to, were still kept in mind with the full determination to visit them if possible.

In describing further in detail this piece of low ground it is well to remark that it is subjected periodically to the rises or oveflows of the two great rivers which, when confined within their banks, serves to form its boundaries on two sides. In its present condition it is therefore practically worthless, aside from the little pasturage it affords during the time the waters are down.

A thick and scarcely unbroken stand of cottonwood appears to cover its surface, beneath which is a rank and almost impenetrable growth of ragweed — save where the cow-paths, roadways and small clearings have been made—much of which impressed me as being unusually tall, arguing well, as I thought, for the fertility of the soil. Here and there a honey locust has sprung up, breaking in a slight degree the distinctive feature of tree growth given to it by the cottonwood. Along the river-front there are some willows, among which the black (*S. nigra*) seemed to be the prevailing form.

A meandering roadway perhaps originally a cow-path, leads from the R. R. track on the Levy to the river, where a government signal-light has been placed. This was selected for my throughfare.

Upon leaving the R. R. the first bird to force his acquaintance upon me was the Jay, who of course, as usual, did not lose much time in making himself known. But one of these noisy chaps, however was seen.

Two Bronzed Grackles were met with shortly after this and, from their actions, led me to conjecture the reason for the sparsity of bird life in this otherwise promising place, and due, as I afterwards supposed, to the abundance of colored-

gunners, though none seemed to be out on that occasion. Hurrying forward, as my time seemed to be limited, three Flickers were encountered, perhaps equally as shy as the Grackles. A Red-shouldered Hawk calls in the distance, and a Ruby-throated Hummer dodges suddenly into view, only to be off in an instant before it was barely possible to count three, much less to accurately determine its sex. After that I fell in with an old acquaintance in the form of the Tufted Tit; and again the clear spirited notes of the Carolina Wren greet me this time from out the weedy cover. Among the willows at the river one solitary Yellow Warbler was seen.

On the return trip I felt myself rather fortunate in noteing the occurrence of a single Olive-backed Thrush; and, on two later occasions, distinguished very clearly, to my satistion, the chipping call, or, social-note, of the Cardinal.

Result fourteen birds, representing ten species only three of which might be termed transcient, the remainder sedentary or permanent resident forms.

Later there were observed near the city, from the car window, the train making quite a detour about its outskirts, two Turkey Buzzards and three Red-shouldered Hawks, thereby bringing up the entire Cairo Horizon to the following.—

Ducks (sp.?) one flock of about	12	
Geese (?) one flock of about	24	
Turkey Buzzard	2	
Red-shouldered Hawk	4	
Flicker	3	
Ruby-throated Hummingbird	1	
Blue Jay	1	
Bronzed Grackle	2	
Cardinal	2	
Carolina Wren	2	
Yellow Warbler	1	
Tufted Titmouse	1	
Olive-backed Thursh	1	
Total	56	individuals

with a possible representation of 13 spieces.

BENJ. T. GAULT, *Glen Ellyn, Ills.*

General Notes.

NOTES ON TERNS. STERNA HIRUNDO, S. DOUGALLI AND S. ANTILLARUM. The Penikese Island colony of Terns (*S. hirundo S. dougalli*) was reported as larger this past summer than last year, though not as large as in the summer of '99. The Woepecket Island colonies have increased in size the past two summers. On two of the three islands there were quite a number of Roseates (*S. dougalli*), but the greater number were Common Terns (*S.hirundo*). A few Least Terns (*S.antillarum*), were found breeding on Martha's Vineyard Island, near West Chop, by Dr. H. Smith, late in July.

I kept two young Roseates and one Common Tern this past summer for about a month in connection with some work on feather pigmentation. In my experience, the Roseates are less easily tamed and they learn to take food less readily. In the course of two weeks, however, the young Roseates became quite accustomed to me and would set up a violent screaming for food at the sound of my steps outside of the room in which they were kept. They usually refused to take food from other persons unless very hungry. My young Common Terns have been uniformly less noisy.

Especially interesting to me have been the wing exercises carried on with evident delight for several days before the birds were able to lift themselves above the ground. On being removed from a cage to an open space, they would grow greatly excited in the pleasure of these wing trials.

So far as my observations go, the young birds do not have to catch fish themselves until a considerable time after they are able to fly. In early August one sees many young birds about Woods Hole accompanied and fed by their parents. The fish-catching habit seems to be acquired largely by imitation and to be only partially instinctive. The young Roseates were left for 7 hours one day without food except for some live young mummichogs (*Fundulus*) swimming in a dish of water in the same room with the birds. The Terns became very hungry, but

they did not make any efforts to catch any of the fish, though they noticed the splashes of the latter.

R. M. STRONG, *Woods Hole, Mass.*

FIVE DAYS AMONG THE ISLANDS OF LAKE ERIE. Five days, from August 5th to the 9th, spent among the islands near the western end of Lake Erie yielded surprising results. We two insatiable bird cranks, Rev. W. L. Dawson and the writer, left Oberlin on the noon train and left Sandusky on the 3:30 boat and were landed on the wharf of Middle Bass Island at 6 o'clock. The work of recording the resident birds began at once. A large pond near the middle of the island was swarming with shore birds of eight species, not to mention a half dozen Great Blue Herons, nine King Rails, many Green Herons, a Bittern and a flock of fourteen Black Ducks. Swallows skimmed the water's surface and Common Terns winged across the island. A solitary Kingfisher sprung his rattle upon us. This was a most propitious beginning. Yellow Warblers were apparently still in full song.

I shall not take the time to go into detail now, but rather briefly summarize the work done.

From Middle Bass we secured a row boat, and in it visited nine islands, involving about 30 miles of rowing, some of it in rough seas. Upon four of the islands Common Terns were still nesting in considerable numbers, while perhaps half of the birds flying about were in young plumage. On one island the Purple Martins formed a roost of nearly 2000 individuals. The best of evidence pointed to a considerable roost of blackbirds on one other island.

It is interesting to note that Carolina Wrens and Cardinals were seen and heard singing on East Sister island, well into the Canadian boundary, while in Lorain county they are not at all numerous. Indeed, the Carolina Wren is a rare find at any time of year. On the other hand, Yellow Warblers were not recorded north of Middle Bass, where they were in full song. The physical conditions were apparently as favorable on East Sister as on Middle Bass, and certainly no less so on North

Bass. Here, too, on these most northern islands the Red-winged Blackbirds were building in considerable numbers, although there was no suggestion of swampiness along the stony beach. True, the nests were placed low down in the brush.

The din of screaming Terns, calling Blackbirds and warbling Wrens was something to be remembered. Indeed, for hours after leaving the vicinity the same sounds mingled with the soughing wind and roaring surf. The Terns were nowwhere so numerous that they obscured the sky, but their numbers were uncountable on four of the smaller islands. Black Terns mingled freely with the Common Terns, but were evidently not breeding anywhere in the vicinity. Likewise the American Herring Gulls, few in numbers, were merely roosting out of harms way.

In all 58 species were recorded. The largest number, 42, were found on Middle Bass. On one rock reef but four species were present.

One cannct resist the conclusion that this chain of islands is a natural highway for the birds on their annual migrations.

LYNDS JONES, *Oberlin, Ohio.*

BLUE-GRAY GNATCATCHER, POLIOPTILLA CÆRULEA.—In my tour of the woods on the 10th of May, I found a nest of this bird saddled upon the horizontal limb of a small post oak tree. Nest about five feet from the trunk of the tree, and about ten feet from the ground. Hillside, high open woods, adjoining cultivated field, through which flowed a small stream. These birds reared their brood undisturbed, nest taken July 1st.

Measurement,—Height, 2.75. Depth, 1.25. Top across, outside 2.50, inside 1.00. Bottom, outside, 1.50; inside, 1.00. Inside walls declining from circumference to center making a shallow funnel shaped cup.

Material.—Entire outside composed of lichens, held together by caterpillar silk, and the stems of the sensitive vine, mixed with a quantity of a little nut brown husk, about one-fourth of an inch in length, the name of which I could not determine. This envelope was separated from the nest entire, without falling apart, making a mat 5.50 inches long on one

side, and 4.00 inches on the other, with a width of 3.50 inches. The remainder of the nest was composed of small feathers and lichens, made compactly together, with a few straggling horse hairs worked in near the bottom.

Although I have read descriptions of the nests of this bird, in which they were described as being fastened to the upright twigs of trees, I have never observed any in such positions. All which I have found in our woods, were saddled upon horizontal limbs, often on the highest branches, but never on the upright growth of a tree.

ROBERT WINDSOR SMITH, *Kirkwood, DeKalb Co., Ga.*

LITTLE BLUE-HERON, *Ardea cærulea.*—An immature female was brought to me on August 6th, by Mr. William Wayne, 3rd, who secured it at a mill dam on Crum creek, about three miles southeast of Berwyn. It is pure white with the exception of the tips of its primeries, and measures: length, 22.00; wing 10.10; tarsus, 4.00; bill, 2.84, in inches. Mr. Wayne informed me that two birds were seen, but one flew too high for a second shot. I believe this is the only record for Chester county, and it appears to have always been quite rare in Pennsylvania. Dr. Warren mentions "two or three taken in the southeastern part of the State," one of which, a young bird, was taken in August, 1875. Unfortunately the rumers of several other "White Herons" seen or shot in this neighborhood in a dozen years, have not been followed up.

FRANK L. BURNS, *Berwyn, Pa.*

COLONY OF BLACK-CROWNED NIGHT HERONS, *Nycticorax nycticorax nævius.*—Some years ago I visited a breeding ground of this species, situated a quarter to a half mile from water, near Columbia. The nests—which were often mere platforms of sticks and twigs—were placed well up and well out on the branches. Several sets of eggs were taken at a height of from sixty-three to seventy-five feet in chestnut trees. As many as five nests counted in a single tree.

LIONEL F. BOWERS, *Columbia, Penna.*

Editorial.

The next number will appear about the first of December. It will be a Special Bulletin on the birds of Berwyn, Penna., a bird census of a section one square mile in extent. The promised stretch of an interesting episode in the life of Alexander Wilson, has not been lost sight of; it will appear later. Enough special and co-operative study matter has accumulated to make several Special Bulletins a probability, and the Officers and Committees of the W. O. C. will continue to collect data with this object in view. Doubtless other schemes of co-operative observation will unfold before the advent of another season, as the interest seems commensurate to the outlay. We would call the attention of our Active Members to the President's notice on another page.

It should be a matter of congratulation to ornithologists of moderate means, that a new edition of Audubon's *Birds of America* is now contemplated, by Messrs. Haughton, Mifflin & Co., the well known publishers of Boston. It is proposed to produce a facsimile of the entire text of the rare and expensive edition of 1840-44, by photographic process. We learn that the encouragement received has not been all that had been anticipated and that further interest must be shown in order to insure the successful publication of this edition. It is to be hoped that enough advance subscriptions will be received, and instead of Audubon's being one of the most inaccessible of works, the low price place it within the reach of all.

The sale of the splendid collection of birds' eggs, nests and skins, owned by Miss Jean Bell, Ridley Park, Penna., to Hon. John Lewis Childs, Floral Park, N. Y., removes from the neighborhood the largest and finest private collection of North American bird eggs in the world.

868 species and subspecies are represented in the 30,000 eggs and 1000 nests. In the forming of this magnificient collection, the following were purchased and absorbed intact; the collections of Josiah Hoopes, Isaac Reiff, Harry R. Jamison, Harry G. Parker, and 1000 selected sets from Samuel B. Ladd, all of

Pennsylvania; also the collection of J. W. Preston, Iowa; Henry R. Taylor, Chester Barlow and H. W. Carriger, of California; Watson Bishop and Harry Austin, of Nova Scotia; and Joseph Grinnell's Alaskian collection. Some idea of its richness and extent may be had by the enumeration of a few examples: 3 sets Cory's Least Bittern, 15 sets Sandhill Crane, 1 set Solitary Sandpiper, 3 sets California Vulture, 90 sets Sharp shinned Hawk, 30 sets Golden Eagle, 22 sets Prairie Falcon, a large series of nests, eggs and skins of Everglade, Swallow-tailed and White-tailed Skite, 1 set of Spotted Owl, 5 sets Clark's Nut-cracker; in short everything procurable, and is said to have necessitated the expenditure of over $25,000, in actual cash, occupying a building erected expressly for the purpose.

Announcement has been made by the Smithsonian Institution, that Dr. W. L. Ralph, Honorary Curator, of the Section of Birds' Eggs, in the National Museum, has undertaken the continuation of the "Life Histories of North American Birds" commenced by the late Major Charles Bendire. The next volume will begin with the Grosbeaks and end with the Vireo and Bahama Honey Creeper. Blanks for co-operative investigation are being sent out.

The time is close at hand when bird study in many sections of the country will be spoken of as a passing fad, a term too often applicable to the collecting of eggs. The publication of that which *Our Animal Friends* terms "mawkish sentimentalism" will sooner or later be fraught with evil to the cause which the writer may wish to advance. Happily, the judicious policy of those whom we look up to as leaders in the movement toward popularizing the science, has kept the rising stream within its legitimate channel—with a few notable exceptions. Where-ever the exception, it does not apply to the numerous periodicals one must take in order to keep abreast of the times. Never have we had so many, so varied and interesting series of the ornithological magazines as at the present time, each with its distinctive features and characteristics. The *Auk* leading, general in character, but withal possessing a strong New England flavor. The *Osprey* with its biographies, rambles afield, etc.,

sometimes brilliant, sometimes ponderous. *Bird Lore*, elegant, typographically perfect, an avowed bird protector; a boon to the beginner. The *Condor*, lone representative of the Pacific slope, an "over-flow meeting" of the *Auk*. *Birds and Nature* with its beautiful colored pictures of great assistance to both teacher and scholar. *American Ornithology*, bright and artistic. The *Oologist*, the mecca of all oologists and exchangers. The *Journal of Maine Ornithological Society*, of more than local interests. The *Wilson Bulletin* with its schemes of co-operative investigation, bird census and horizons. Many other papers and magazines regularly devote from half a column to many pages to the subject, besides the inevitable "mushrooms" which cannot be taken seriously.

Dr. R. W. Shufeldt has removed from Washington, D. C., to New York City. His address is 502 West 142nd St., Hamilton Place.

President's Address.

The Wilson Ornithological Chapter was organized as an associatien of ornithologists, who desired to do original work on a co-operative basis. It has published bulletins which we feel were worth all they cost and it has served as a training school for a number of young ornithologists.

Field work is naturally the most available line of study for our members and our bulletins are best known as field study publications. Under the head of field studies, we do not, however, include simple descriptions of collecting trips or collections. Collecting can never be to the investigator anything more than a means towards an end and collections are of little scientific value except as they furnish material for scientific studies that are of themselves worth while.

We have several committees engaged in special lines of field work on the co-operative plan. Every member is urged to report to the chairmen of the various committees his observations, even if they are few. Members are also urged to extend the usefulness of these committees by obtaining new members,

who will be willing to enter into the spirit of our work and to undertake the various lines of study we have outlined. Information concerning our work may be obtained from Mr. Lynds Jones, Oberlin, Ohio.

Our constitution calls for an annual election of officers. We were once in the habit of holding this election regularly, but during the past two or three years it seems to have been forgotten. There appears to me no better way to make amends for past neglect than to call for a regular election. Every active member is urged to make nominations to the secretary at once. A list of candidates will then be published and an election held by mail. As the office of secretary is at present vacant, I appoint Mr. Benj. T. Gault to be secretary for the few weeks remaining before a regular secretary can be elected.

The officers to be elected are a president, secretary, treasurer, and three members of the executive council.

According to our constitution any active member may place in nomination during the month of September, one eligible member for each elective office; all nominations to be sent to the president.

R. M. STRONG, W. O. C., President,
Woods Hole, Mass.

A Criticism.

A criticism in the March-April number of "The Condor," upon Bulletin No. 33, which is a running account of "A Summer Reconnoissance in the West," under the joint editorship of the writer and Rev. W. L. Dawson, seems to call for some comment. It is true that the criticism is mainly directed against the writer's list taken in Los Angeles county alone, but some remarks of a general nature seem to reflect upon the whole enterprise.

In the interest of accuracy the criticism is welcomed, the more so, because for Los Angeles county it accomplishes what did not seem feasible in the small space allotted to that large field; namely, indicating what species were rare and therefore

would not likely be seen by the tourist who is only causually interested in birds.

It seems to the writer that our critic was unfortunate in his choice of the form of destructive criticism, because it has no doubt led him much farther than was intended. Furthermore, he has wholly misconstrued the spirit of the "Reconnoisance." It was not intended that the results have any general scientific value. We were out to become acquainted with as many species new to us as possible, and had nothing other in mind than to satisfy ourselves. In our own opinion we have made no local lists, and therefore compete with none. Our object in placing the results of this work before the reading public is only to give a concrete illustration of what one may accomplish in the way of a study of the birds during "a ride on a rail."

I am fully in sympathy with my critic in seeking to save his locality from errors of identification, but I still maintain that ability to determine species on the fly is no less worthy of endeavor than the ability to determine in hand scarcely discernible differences in closely allied forms. I protest against the notion that the only good bird is a dead bird.

To pass on, now, the species objected to. Green-tailed Towhee and Western Winter Wrens are pretty clearly mistakes due to a too hasty revision of my field note-book. The California Thrasher and Samuel's Song Sparrow are indistinguishable in the field from the closely allied forms and since their franges are not adequately defined in any writings available both forms were admitted. A better plan would have been to follow them with a question mark. While the record of the Prairie Falcon and Black-tailed Gnatcatcher may not satisfy anybody else, the specimens not having been taken, I have no doubt about them. The Falcon has become so familiar to me in the regions just traversed that I could not have mistaken it for any of the other Raptores likely to occur there. The Gnatcatcher was too well seen to warrant a doubt. The California Cuckoo could hardly be mistaken for any other species, especially in the setting in which I found it. It is wholly against the experience of the most of us that because a species happens

to be rare in our locality that therefore the person who comes for a brief study will not find it. For nine years I have looked in vain for the Short-billed Marsh Wren in this county; but last year one of my students found one! A week later I also had that privilege.

In our critic's statement, "It is unnecessary to call attention to other identifications almost as glaring, for enough has been said to illustrate the danger of publishing local lists without years of experience gained in the locality itself." I cannot but feel that he has been led into a too sweeping statement by the style of criticism adopted, and certainly his idea that this list is intended to pose as a loca list is mistaken. A careful scrutiny of the list does not reveal any other species than those which he has mentioned to which serious exception should be taken.

It is our intention to revise the whole paper to conform to the late Supplement to the A. O. U. Check-List, when other records which seem to us questionable will be called attention to. Another expedition of a similar nature, but with a scientific setting, is being planned, when we shall have opportunity to compare this initial work with the later.

LYNDS JONES, *Oberlin, Ohio.*

Publications Received.

Pacific Coast Avifauna, No. 2. (A List of the Land Birds of Santa Cruz County, California.) By Richard C. McGregor. Cooper Ornithological Club of California. May 15, 1901.

This paper of nearly 22 pages is the second in the series of papers too extensive for publication in the official organ of the Cooper Club. It is a most happy arrangement by which the papers of greater importance which this active organization is presenting from time to time may be preserved separately, with their own paging.

The paper consists of two parts, the Introduction and the list of Land Birds. The Introduction gives one an insight into the methods of work, the amount of time spent, the sources of

information and a lucid description of the county, including the "Faunal Position of Santa Cruz County," taken from "Life Zones and Crop Zones of the United States," by C. Hart Merriam. Many foot note references in this part as well as in the list which follows furnish a bibliography to the paper.

The list of Land Birds impresses us as being one which has been prepared with great care both from the standpoint of an accurate list and in giving full credit to all who have worked in the region. The annotations upon the 139 species, though usually brief, are well chosen and add interest and value to the list. The only improvement in the typographical appearance, which is unusually good, might be a different style of character for the reference figures.

The paper is a valuable contribution to our knowledge of the birds of that region, and the author is to be congratulated.

L. J.

On the Osteology of the Striges. (*Strigidæ and Bubonidæ.*) By R. W. Shufeldt, M. D., Proc. Am. Phil. Soc., Phila., Vol. XXXIX, No. 164, pp. 665-722, pll. X-XVII. Dr. Shufeldt has written much concerning the anatomy of Owls at various times and in different places since the publication of what he tells us was his first paper which was a memoir devoted to the *Osteology of speotyto cunicularia hypogæa.* In the present paper Dr. Shufeldt gives "a very general contribution to the study and comparison of the osteological characters presented on the part of the skeletons of all of the North American species, or at least genera, of *Strigidæ.*" There are a number of illustrations, some of which are very fine plates and which are very satisfactorily elucidated in the text. Those of the skull are especially well executed and serve well to illustrate the interesting and valuable points Dr. Shufeldt directs attention to in the consideration of the morphology of the cranium to which particular attention is given, although the vertebral column and appendicular skeleton are not neglected.

In the beginning of the work, Dr. Shufeldt gives a number of osteological features which have been pointed out by Mr. F. E. Beddard and then supplements this by a list of his own,

which furnishes a valuable synopsis of very easy reference.

W. E. R.

On the Osteology of the Woodpeckers. By R. W. Shufeldt, M. D., Proc. Am. Phil. Soc., Phila., Vol. XXXIX. No. 164, pp. 578-622, pl. IX. In this paper Dr. Shufeldt gives a detailed account of the comparative osteology of the *Pici*, being the result of ten years collecting of these forms. The author has written a number of articles on this subject, the most important of which appeared in the *Proceedings of the Zoological Society of London.* (February 3, 1891,) but the present memoir is the most complete one that has ever been written on the subject.

Dr. Shufeldt takes the subject up in a *general* rather than in a *special* manner and calls attention to the salient osteological features of many species of Woodpeckers, chiefly American, rather than devoting himself in detail to a single form, and, herein to our mind greatly rests the value of this paper; for in the present state of our knowledge it seems to us that this paper covering the ground which it does is of far more value than an elaborate account of the osteology of a single type would be, for, as the special osteology of the woodpeckers has not been as yet satisfactorily worked up it follows that a general work such as we have before us is what is especially desired at the present time.

Dr. Shufeldt also gives his views as to the relationship of the Woodpeckers and we cannot do better than quote his own words: "It is my opinion that it is to the great Passerine group that the *Pici* are more nearly affined than to any other existing suborder of birds. * * * * I here venture to state that as our knowledge of the morphology of *Aves* becomes more perfect the fact will be appreciated that the *Pici* and the *Passeres* are divergent groups from a common stock in time; and that the former have simply become highly specialized and modified in accordance with their mode of life and habits."

W. E. R.

The Osteology of the Cookoos. (*Coccyges*). By Dr. R. W. Shufeldt, Proc. Am. Phil. Soc., Vol. XL., No. 165.

In this memoir Dr. Shufeldt gives particular attention to the osteology of the *Geococcyx californianus;* most of the plates are well executed, especially those of the skull and pelvis, which structures receive detailed attention in the text. Taking *Geococcyx* as a basis for comparison a number of different types are considered, as *Crotophaga, Centropus, Diplopterus, Coccyzus,* and others. It is of interest to note that in *Coccyzus* the trachial rings are as completely ossified as are any of the trachial rings among the *Passeres.* There is also herein included some notes on the osteology of a nestling of the *Coccyzus americanus.* At the end of the paper there is a "Synopsis of the Principal Osteological Characters of the three subfamilies of of the United States Cuculidæ"; which probably will be found quite useful, and finally Dr. Shufeldt closes the subject with a very brief but none the less interesting discussion of cuculine kinships. W. E. R.

Yearbook of the United States Department of Agriculture, 1900. The value of this publication to the people it reaches is undoubtedly great. 500,000 copies are issued yearly. Ornithologically, two papers interest us. The first: *How Birds Affect the Orchard,* p, 291-304. By F. E. L. Beal, B. S., gives an informal annotated list of some birds important to the fruit grower, which include Woodpeckers, Titmice, Nuthatches, Brown Creeper, Cuckoos, Baltimore Oriole, Warblers, Vireos, Birds of Prey, and Shrikes. Under the somewhat misleading subtitle of "Birds Harmful to the Orchard," we have the Purple and House Finches, Robin, Catbird and Cedar Waxwing. Although the varities of fruit eaten, extent of damage, and localities affected are cited in the text; the wisdom of so placing some of our Eastern birds, particularly the Robin, in this category might well be questioned, as even the qualifying afterthought expressed in the investigator's belief "that the damage is usually caused by an abnormal abundance of a species within a limited territory," cannot wholly efface the impression already received. The omission of the European House Sparrow, which unquestionably destroys a greater variety and quantity of cultivated fruits in many sections of the country than all the native

species together, is perhaps unfortunate. *The Food of Nestling Birds*, p. 411-436, by Sylvester D. Judd, Ph. D., goes into the subject pretty thoroughly. It is surprising what a large amount of valuable information the writer has placed in order. A number of diagrams illustrating the proportion of food of both nestling and adult of many of our common birds show the comparative value at a glance, where a mere statement of percentage would fail nine times out of ten. Several plates from photographs taken of young in nest also appear. In conclusion he says: "It will be observed that whatever the character of the food of the adult bird, the young, excepting those of Doves and Pigeons, are at first fed on animal diet, and that this diet is gradually changed, where change is necessary, to conform to that of the mature bird. This is probably due to the fact that animal food has a higher nutritive value and is more easily digested than the available vegetable food. As nestlings increase in weight from one-fifth to one-half daily, and at certain stages of growth require daily more than their own weight in insects, it is essential that their food should be readily obtainable. Spiders, grasshoppers, caterpillars and crickets answer these requirements very well and are a favorite nestling food with many of passerine or perching birds. Birds that are largely vegetarian mingle fruit or grain in constantly increasing quantities with the insects fed to their young, though insects usually remain the chief component of the food until maturally is nearly reached. But these birds generally substitute such insects as hard beetles, carabids, dung-beetles, may-beetles and weevils for the softer food of other perching birds. The caterpillars selected are generally such hairless kinds as canker worms, cutworms, and army worms, all of which are serious pests. But hairy caterpillars are eaten to a certain extent." F. L. B.

Periodicals Received.

American Ornithology, Vol. I, Nos. 2, 5–9, Feb., May–ept.

Bird Lore. Vol. III, Nos. 1–4, Jan.–Aug.

Birds and Nature, Vol. X, Nos. 1, 2, June, Sept.

Book Reviews, Vol. IX, Nos. 1–6, Jan.–June.

Bulletin Wisconsin Natural History Society, Vol. I, No. 4, une.

Condor. Vol. III, Nos. 1–4, January–August.

Farm, Stock and Fireside, Vol. I, Nos. 5–11, June–Sept.

Fern Bulletin, Vol. IX, Nos. 2, 3, April, July.

Forester, Vol. VII, Nos. 7, 8, July, August.

Journal of Applied Microscopy and Laboratory Methods, Vol. V, No. 8, August.

Journal of Maine Ornithological Society, Vol. III, Nos. 1–3, anuary–July.

Naturalists' and Fanciers' Review, Vol. II, No. 9, March.

Ohio Agricultural Experiment Station Bulletins, Nos. 110–26, December, 1899 to March, 1901.

Oologist, Vol. XVIII, Nos. 1–9, January–September.

Our Animal Friends, Vol. XXVIII, No. 12, July; Vol. XXIX, o. 1, Sept.

Photogram, Vol. VIII, No. 90, June.

Popular Science News, Vol. XXXV, Nos, 7–9, July–Sept.

Transactions of the Massachusetts Horticultural Society, 900. Parts 1 and 2.

WANTED

Avi-Fauna, No. 1. **Audubon Magazine**, Vol. I, No. 1.

American Naturalist. Number containing articles commencing on following pages: '85, p. 407; '86, p. 661 and 777; '97, p. 622, 812 and 907.

Journal Maine Ornithological Society, Vol. 1. Nos. 1 and 4. Vol. II, Nos. 2, 3, 4.

Iowa Ornithologist, Vol. IV.

Old Curiosity Shop, Vol. VII, Nos. 2 and 12.

Observer, Vol. I, Nos. 4-8, 10-12, Vol. II, Nos. 2, 4, 6. Vol. VII, Nos. 1, 11 and 12. Vol, VIII, Nos. 3, 4, 9-12.

Ornithologist and Botanist, Vol. II, Nos. 3-5.

Oregon Naturalist, Vol. IV, Nos. 6, 8 and after 9.

Oologist. (Utica, N. Y.,) Vol. I to V, ['75 to '80.]

Forest and Stream. Numbers containing articles commencing on following pages: Vol. XIII, p. 1024; Vol. XIV, p. 6 and 25.

I can offer in exchange long list of duplicate numbers of papers and magazines, including *Nidologist*, *Osprey*, *Oologist*, *Forest and Stream*, *American Field*, *Fishing and Shooting*, *Recreation*, *Century*, *Lippincott's*, etc., etc., or cash if prices are right. Duplicates to offer in exchange for eggs, skins or cash.

Frank L. Burns, **Berwyn, Penna.**

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THE WILSON ORNITHOLOGICAL SOCIETY

November 1982

A SECTIONAL BIRD CENSUS.

Taken at Berwyn, Chester County, Pennsylvania, During the Seasons of 1899, 1900 and 1901.

With a better understanding of geographical distribution it becomes desirable, in local lists at least, that a more accurate estimate of the bird population should be employed than the usual expression of indefinate terms. The time-honored phrases, however admirably graduated, often utterly fail to give a clear idea of the numerical status of a species, and are useless for comparative purposes generally. On the other hand a bird census of a not too restricted area accomplishes at least two desirable objects: It forms a reasonably accurate basis for comparison with similar tracts, or future enumerations over the same ground reveals the rate of increase or decrease; and it enables an approximation of the total bird life to be made of a larger section.

The writer does not plead any special qualifications for the work other than that the locality has been most familiar ground for the past twenty years. The task was not light and the manner of accomplishing it varied according to circumstances. Thus, while the discovery of a tenanted nest was considered final and conclusive evidence of residence, the exact location of every nest was deemed impossible without unlimited time and energy. The many little traits, so well known to the oologist, indicating the nearby habitations; repeated horizons; the corroborative evidence in the shape of the empty nests exposed by the falling leaves; all figured to a greater or lesser extent in the final count, with a constant leaning toward conservatism. Much time was consumed in amassing the necessary data, especially during the last two years. The enumeration was

timed so as to take the various species in the midst of their breeding season. Dividing and simplifying the labor wherever practicable, I still found the work very exacting and not to be again attempted without serious thought.

In blocking out a tract one square mile in extent, I chose a piece of land believed to be in no way inferior or superior in point of attractiveness to the surrounding country. It is diversified enough to contain hill, ravine, swamp, creek, wood, thicket, clearing, meadow, cultivated field, orchard, lawn, railroad, street, and a fair representation of the fauna and flora at large. It is moreover, accessible to my home, and land over which I am free to tramp. Tracings were made from an excellent township and property map, and exact boundaries established. It is an irregular square, not quite the same ground as that described in my Warbler Census (*Osprey, Vol. II, p. 48.*), extending more to the north and west, consequently less to the south and east.

The southern line runs a few rods beyond Paoli road and continues through the middle of the village along Berwyn avenue. To the east, it begins at a point on the Pennsylvania railroad just below the Philadelphia and Lancaster turnpike bridge and runs north parallel with Warren avenue to the old Lancaster road, thence along the hillside just east of and parallel with the most direct road to Valley Forge, locally known as "contention lane." On the north it extends into the Great Chester Valley, being bound by the State and Howeltown roads and at two points slightly beyond them. The western boundary averages a few rods beyond the Mahaffey road. The southeast and southwest corners are clipped, and a great indentation made in the northern line just west of the centre; otherwise it is as previously stated, a rough square.

Two railroads, one of four and the other of two tracks, run through it from east to west; and it contains a population of six hundred and twenty-five souls. About one-tenth of the territory lies in Easttown township and the remainder in Tredyffrin township, extreme eastern part of Chester county, twelve miles from West Chester and seventeen miles from Philadelphia city hall. Approximate latitude, 40 degrees. Approxi-

mate longitude, 1 1-2 degrees east of Washington. Altitude at Berwyn railroad station 495, to about 540 at hill crest, and about 225 feet above tide at northeastern corner in the valley. I am indebted to the United States weather bureau for the mean temperature, 68.68 degrees Fahrenheit and humidity 67, of Philadelphia for the past three years from April to August inclusive, which about covers the breeding season. It averages a little cooler and dryer at Berwyn.

South Valley hill, of which this block is but a small section is the edge of a low table land (500 to 600 feet) is composed of mica slate, doubtless of sedimentary origin and very ancient.

This ridge slopes into the valley on the north, and on the south forms but a part of the undulations to the Delaware valley; as a whole however, unbroken for many miles and constitutes the water shed between the Schuylkill and Delaware rivers. Within the stated area, on the south side four brooklets have their source, unite into the Darby creek a mile or so below, and flow into the Delaware below Philadelphia. On the north, less than a quarter of a mile from springs of the above, rise two branchlets of Trout run, which sparkling and glancing in the sunlight obliquely across the green valley, mingles its waters with that of the Schuylkill below Port Kennedy. At the extreme northern boundary a tiny stream has its begining, trickling down through many a shaded dell to join the East Valley creek which in turn empties into the river at Valley Forge.

The northbound streamlets are invariably flanked by the steep ravine slopes, which in turn are cleft and seamed with lesser ravines and gullies. Owing to an upheavel of the slaty strata, the eastern side is always much more precipitous, often with the rocks exposed, while the opposite side is covered with earth.

The Great Chester, or Downingtown Limestone valley, as it is designated geologically, is a narrow basin averaging two and a half miles wide. fifty-eight miles long and from two hundred to four hundred feet deep. The limestone overlies the white or Potsdam sandstone, which represents the earliest stratified rock in the country and lies near the surface on the

North Valley hill. I cannot do better than quote Prof. H. D. Rogers in his description of this valley in prospective: "Externally the tract with the highly cultivated farms, numerous thriving villages, factories, furnaces and mills presents a scene unsurpassed in the United States. The soft, picturesque beauty of the plain or bed of the valley is much inchanced by the remnants of the natural forests. It lies between these like the deck of a slender boat between its sloping sides. The surface is in almost every part irrigated with running brooks of pure, transparent water. The enclosing hills, or two edges of the general upland between which this valley lies, at an average depression of nearly three hundred feet, are superbly carved into numerous wooded ravines and narrow dells. From any point on the southern table land near the head of one of its ravines, the view is truly enchanting, broad slopes of foliage and a shady dell fill the foreground, wheaf fields and pastures, orchards and snug, tidy farm houses, many of them of the dignity of country mansions, occupy for miles the middle distance, and the extended back-ground is a rich succession of fading hills and far stretching mountains." As Prof. Rogers has stated, this ridge as also the opposite hill range, is covered with a growth of decidous timber which though but a narrow strip at some places, is almost unbroken throughout its length of many miles.

Once more confining my statements to the local square, we have about 170 acres of timber from sproutland to trees averaging perhaps sixty years old. Ninty-five feet would probably top the highest chestnuts which predominate, with a varying admixture of oak *Quercus tinctoria*, *Q, alba*, *Q, prinus*, hickory *Carya tomentosa*, tulip poplar, *Liriodendron tulipifera*, beech, red maple, and a sprinkling about the borders principally of red cedar, sycamore, wild red cherry, sassafras, gum, black walnut, birch *Betula lenta*, mulberry, slippery elm, hackberry *Celtis occidentalis*, swamp willow, laurel *Kalmia latifloria*, flowering dogwood and spicewood. A few of the commoner woodland and swamp plants are the windflower, mandrake, bloodroot, shepherds' purse, pepper grass, yellow violet, jewel weed, poison ivy, wild sarsaparilla, bush honeysuckle, part-

ridge berry, wild astor, wild huckleberry, trailing arbutus, spotted prince's pine, pennyroyal, boneset, skunk cabbage, Indian pipe, poke, Indian turnip, calamus, showy orchid, winter, summer and maiden hair ferns. Patches of hair and coral moss are frequent, and tangles of greenbriers, chicken and fox grape vines, also sweet and poison shumac, form safe retreats for the smaller birds.

Almost three-fourths of the tract is cleared. In addition to many of the trees already named, the following are found singly or in clusters: persimmon, catalpa, yellow locust, tree of paradise, weeping willow, Lombardy poplar, silver maple, white ash, pines *Pinus strobus* and *rigidus*, spruce and cherry. Of cultivated fruits about eight or ten acres of apple orchards, and many pear, cherry, peach, and smaller fruits; the pear being by far the most flourishing. Over a mile of hedges, commonly Osage orange, Norway spruce, *Arbor vitæ* and privet.

Indian corn, wheat, rye, oats, timothy, red and white clover, and occasionally a little buckwheat, Hungarian grass and tobacco are grown. Of the many vegetables the white potato, tomato, cabbage, onion. string bean, pea, radish, beet, okra, celery, egg plant and pepper, flourish best. A goodly portion being in well kept lawns, the various hardy plants and shrubs are too numerous to mention. The climbing vines such as woodbine, bitter sweet, Virginia creeper, trumpet, etc., are commonly trained about fences, arbors and buildings.

Not many years ago there were little cleared ground that was neglected or uncultivated, but since the advent of the land speculator, in the name of suburban improvement, many small farms aggregating about 130 acres have become idle, unproductive save for pasture, and are slowly drifting back to nature. The grasses, dandelion, buttercup, oxeye daisy, violet, yarrow, and rag weed are being superceded by the goldenrod, wild carrot, milkweed, Spanish needle, shepherd's purse, Canada thistle, wild rose, burdock, poison ivy, red cedar bush, wild strawberry, dewberry, raspberry, and blackberry, all of which must yield in turn to the sassafras, dogwood, wild cherry, shumac, wild grape vine, greenbrier, etc., unless reclaimed in the meantime.

Of the wild animals, native and introduced, the red fox, *Vulpes fulvus*, weasel *Putorius ermınea*, skunk *Mephitis mephitica*, brown bat *Vespertilia subulatus*, mole *Scalops aquaticus*, white-footed mouse *Hesperomys leucopus*, meadow mouse *Arvicola ripairus*, house mouse *Mus musculus*, house rat *Mus decumanus*, grey squirrel *Sciurus carolinensis*, flying squirrel *Sciuropterus volucella*, red squirrel *Sciurus hudsonius*, ground squirrel *Tamias striatus*, grey swamp rabbit *Lepus sylvaticus*, and opossum *Didelphia virginianus*, are more or less common; and the mink *Lutorius vison*, raccoon *Procyon lotor*, and muskrat *Fiber zibethicus*, are occasional, and more common a short distance beyond the boundary. The ground hog *Arctomys monax*, so common fifteen years ago, is now well nigh exterminated in the immediate vicinity.

Reptilia is poorly represented in the number of individuals except in the box tortoise, gartersnake and blacksnake. An occasional river tortoise, red terrapin, mud turtle, watersnake, house adder and viper may be found. We have two species of the bull frog, tree frog, toad; and a few fish: striped dace, red-fin, roach and brook trout. Crayfish are common, and a species of land snail plentiful in the woods. Slugs are not uncommon in gardens. Among the woodland spiders, the geometrical is the most prominent.

It would be impossible to give more than a few of the more injurious or most noticeable of the many insects. The black and red ants, sulphur butterfly, tent caterpillar, corn-ear worm, cut worm, tobacco worm, green fruit worms, squash vine borer, apple-tree borer, may beetle, Colorado potato beetle, stink-bug, common and striped squash bugs, click beetle, fruit tree bark borer, plum curculio, dog locust, leather-winged locust, red-legged grasshopper, katydid, black cricket, etc.

1. **American Woodcock** *Philohela minor*. Formerly common both as a transient and a breeder, it is now so uncommon as to be scarcely worth hunting. Not more than a pair can be found here in nesting time, and there are few migrants passing.

2. **Killdeer** *Ægialitis vocifera.* Like the above, this is a a decreasing species. Now found only in well watered meadows, in this neighborhood. One pair annually nest near the foot of the hill, in the valley, and just inside my territory. 2

3. **Bobwhite** *Colinus virginianus.* The last covey was exterminated within recent years. A stray cock may be heard nearly every summer, but apparently always mateless. Kansas birds are now being introduced in the valley and are taking to the hills. 1

4. **Mourning Dove** *Zenaidura macroura.* I have not found the Turtle Dove very common in this vicinity. Three pairs noted this year and two pairs in former years. 4

5. **Cooper's Hawk** *Accipiter cooperi.* The Privateer is pretty evenly distributed throughout this section. A pirate always, it takes possession of a Crow's nest well up in hardwood timber. One, sometimes two pairs, nest in the block. 2

6. **Broad-winged Hawk** *Buteo latissimus.* A regular breeder in chosen territory. This tract has seldom been without a pair. Incubation in one instance twenty-four days, and young left nest in about forty-one days. 2

7. **Sparrow Hawk** *Falco sparverius.* For many years a pair occupied the hollow limb of a revolutionary "watch tree," overlooking the valley; an immense chestnut nearly eight feet in diameter at the base ; fire and a great wind storm leveled this giant to the earth one year ago, however, and I have not yet yet located the present nesting site of the birds. 2

8, **Screech Owl** *Megascops asio.* In this section the red phase predominates. Four pairs may be safely given. 8

9. **Yellow-billed Cuckoo** *Coccyzus americanus.* This and its relative, the Black-bill, destroy a great many of the hairy caterpillar pests. From three to six pairs are annually present. 8

10 **Black-billed Cuckoo** *Coccyzus erythrophthalmus.* I have found this species somewhat erratic. Sometimes equaling the above, but within the past few years I am sure of only one pair. 2

11. **Downy Woodpecker** *Dryobates pubescens medianus.* Fairly constant. The flying squirrel frequently uses the deserted nesting cavity of this little bird. Five pairs seem to be the average number nesting. 10

12. **Red-headed Woodpecker** *Melanerpes erythrocephalus.* This is more of a lover of old orchard and heavy grove timber than of our chestnut belt. It is, however, more frequent than ten years ago. One pair may be found in this tract. 2

13 **Flicker** *Colaptes auratus.* From three to six pairs breed annually. Most abundant in the more open country to the south of us. 8

14. **Nighthawk** *Chordeiles virginianus.* Considering it locally, it is perhaps nearly as rare as the Whip-poorwill. I record one pair. 2

15. **Chimney Swift** *Chætura pelagica.* I know of no instance where more than a single pair occupy the same flue for nesting purposes. For the past three years the local contingent numbering as high as fifty or sixty individuals have roosted in one of our chimneys previous to migrating. We have at least sixteen pairs of breeding birds. 32

16. **Ruby-throated Hummingbird** *Trochilus colubris.* I am not sure that as many as four or five pairs do not breed within the given area, but I have positive proof of only two pairs in any one year. 4

17. **Kingbird** *Tyrannus tyrannus.* Present every season but extremely variable. Five pairs found in one year but the normal number is less than half. 4

18. **Crested Flycatcher** *Myiarchus crinitus.* Too noisy to be overlooked, yet secretive enough in domestic affairs. Averages eight pairs. 16

19. **Phœbe** *Sayornis phœbe.* One nest with fresh lining occasionally does triple duty as crib when the bird is not seriously molested. Two pairs occupy separate deserted springhouses, one pair in stone wall of dismantled house, and another pair occupy a stone culvert under railroad; and return yearly to the same places. 8

20. **Wood Pewee** *Contopus virens.* From three to six pairs, more often the latter. 10

21. **Green-crested Flycatcher** *Empidonax virescens.* Regular in its haunts along the thicket-bound streams. Five pairs. 10

22. **Blue Jay** *Cyanocitta cristata.* The three to five pairs not easily passed unnoticed. 8

23. **American Crow** *Corvus americanus.* From four to six pairs annually nest, in late years; probably a greater number in former times. 10

24. **Fish Crow** *Corvus ossifragus.* A late addition to our local avian-fauna. First observed in 1898, and one or two pairs have been found in this tract ever since, nesting in the top of the tallest trees, usually chestnuts. Now common in the neighborhood. 2

25. **Cowbird** *Molothrus ater.* One male and two females have commonly been met with, though doubtless others occasionally invade the block. 3

26. **Meadow Lark** *Sturnella magna.* Seldom absent at any time of the year, though more common on either side of the ridge. During deep snows it will sometimes approach houses and feed upon the berries of the bitter-sweet and woodbine. Four pairs in grass fields. 8

27. **Orchard Oriole** *Icterus spurius.* Averages four pairs in late years. 8

28. **Baltimore Oriole** *Icterus galbula.* The Golden Oriole prefers the drooping branches of the weeping willow as a nesting place and regularly returns to its old haunts. Five to six pairs are found yearly. 10

29. **Purple Grackle** *Quiscalus. quiscula.* For many years a small colony have occupied the evergreen trees about Wynburn Inn. In the spring of 1898 only eight pairs were present, and in the past three years seldom exceeded twenty birds. An outlying pair occupy an apple or sycamore tree, half a mile distant. 22

30. **American Goldfinch** *Astragalinus tristis.* Roving until nearly all other birds have done with domestic affairs, it is very hard to enumerate. Old and young feed almost exclusively for a time on the ripening sunflower seeds grown for the domestic fowls. Six pairs would be well under the limit. 12

31. **Vesper Sparrow** *Poocætes gramineus.* The Grass Finch is less common than formerly. About eight pairs present. 16

32. **Chipping Sparrow** *Spizella socialis.* In the early '80's I found it nesting most numerously in cedar bushes, now it is most frequent about vine-clad piazzas, hedges, fruit and ornamental trees and bushes. The Chippy has suffered much from the small boy and cat. Not quite so abundant as formerly, now averaging about thirty-nine pairs. 78

33. **Field Sparrow** *Spizella pusilla.* Only a very careful enumeration convinced me that this species outnumbered the preceding. It nests more often above than on the ground. Fifty-nine pairs on an average in last three years. 118

34. **Song Sparrow** *Melospiza melodia.* Much like the Field Sparrow in nesting habits, but more domestic. Very abundant as a transient. 44

35. **Towhee** *Pipilo erythrophthalmus.* I should judge, that the fifteen pairs now found in this area, is but half the number nesting up to and including 1898. 30

36. **Cardinal** *Cardinalis cardinalis.* Haunting the greenbrier thickets. 1898 to 1900—three pairs; 1900—two pairs. 4

37. **Indigo Bunting** *Passerina cyanea.* Local station substantially the same as the Blue-winged Warbler. Breeding season frequently extends well into July. Eleven pairs. 22

38. **Scarlet Tanager** *Piranga erythromelas.* Inhabits wood borders, usually near roads or paths. One pair built in my home orchard in 1901. There appears to have been a gradual and substantial increase up to the end of the century. The maximum number for 1900 and 1901 is twenty birds. Taking into consideration the conspicuous plumage of the males, I still believe that they actually exceed the females in number. 20

39. **Purple Martin** *Progne subis.* Two or three pairs located in a box erected by Mr. Washington Harris, in 1889. Seven years later I succeeded in attracting a young pair to quarters prepared for them, and have had a small colony, not exceeding three pairs, ever since. Previous to the above instances, the Martin has been a stranger to the tract, though breeding a few miles away. Much commoner in the Southern portion of the county. 10

40. **Barn Swallow** *Chelidon erythrogaster.* Of the four barns formerly sheltering this bird, one has been demolished, another burned down, and the third closed against it; the fourth is situated in the valley and accommodates about ten pairs. 20

41. **Cedar Waxwing** *Ampelis cedrorum,* Four pairs nesting in shade and fruit trees. 8

42. **Red-eyed Vireo** *Vireo olivaceus.* This tireless singer chiefly inhabits the woods and thickets. A few pairs may always be found nesting in the shade trees about dwellings. The nest is not hard to find after the leaves have fallen and their number justifies my approximation of fifty-five pairs. 110

43. **Warbling Vireo** *Vireo gilvus.* I have noted but eight pairs in any one year hereabout, two pairs in North Berwyn; all found about large maples near dwellings. 4

44. **Yellow-throated Vireo** *Vireo flavifrons.* I have twice discovered the nest and three eggs of a single pair which yearly haunt the larger swampy thicket. 2

45. **White-eyed Vireo** *Vireo noveboracensis.* A pair in either of the swampy thickets. Perhaps not so well represented as it should be. 4

46. **Black and White Warbler** *Mniotilta varia.* So conspicuous as a transient, it is wonderful how invisible it becomes as a housekeeper. It inhabits the rocky hillsides where the trailing arbutus and laurel grow under the trees, and extends down to the damp thickets of the bottomlands. When the young are well along, it is familiar enough. My enumerations were made principally from the singing males, with later family groups as corroborative evidence. Eight to twelve pairs. 20

47. **Worm-eating Warbler** *Helmitherus vermivorus.* Perhaps as common here as anywhere else in the country as a summer resident. It loves the steep wooded hillsides and ravine slopes above the running brooklets, building its nest under a drift of withered leaves which have lodged against a laurel sprout, wild huckberry spray, sapling or a dead stick; though it is only less common on the gentle slopes where conditions are suitable. I know of no other ground-nesting Warbler that gives greater delight to the eye than this trim, slender and graceful little member as it dodges nimbly above and about the fallen leaves, or sits so bravely and defiantly in its snug cave-like dwelling, calmly eyeing the intruder; doubtless trusting to the last minute in the mimicry of self to the surroundings. I have examined over fifty nests and found them all lined with the flower stems of the hair moss, *Polytrichium*, which is a distinctive trait throughout its its breeding range, I believe. For a Warbler, it is a remarkably persistent breeder, and will return year after year to near the same spot, if not too often

disturbed. The nest is often built in three days. The period of incubation in one instance was thirteen days, and the young left the nest on the morning of the tenth day. From fifteen to seventeen pairs noted, 32

48. **Blue-winged Warbler** *Helminthophila pinus*. A common inhabitant of the rather open swampy thickets, upland clearings, neglected pastures and fence rows, building its nest midst the tangle of young saplings, wild grape vines, blackberry and raspberry bushes, in a clump of grass, goldenrod or brier shoots. When the female is sitting close, the male makes little excursions in all directions, singing his locust song. From ten to thirteen pairs were observed. 22

49. **Yellow Warbler** *Dendroica æstiva*. While said to be abundant in some parts of the county, it is here comparatively rare. In the early summer of 1899, I observed a male taking a bath in a spring, and have since found a pair frequenting an upland clearing but they could not be traced to their nest at any time. I think that this section would scarcely yield a single pair to the square mile. 2

50. **Ovenbird** *Seiurus aurocapillus*. From early May until July the loud asserting chant of this Warbler may be heard everywhere until the very woods resounds. It would be folly to attempt anything more than an approximate figure of the number of individuals with less than practically unlimited time and energy. My estimates were obtained by repeatedly visiting every tract of woods at different times of the day, and taking the average as the probable number of breeding birds. The total of forty-one pairs I regard as conservative. 82

51. **Kentucky Warbler** *Geothlypis formosa*. It would seem almost incredible that so keen an ornithologist as Alexander Wilson should have overlooked this bird in Pennsylvania if it had not been uncommon or local at that time. Discovering it in Kentucky and subse-

quently observing it in Tennessee and Louisiana, we do not know that he ever met with it east of the Alleghanies. In 1832 Nuttal quotes Wilson, and adds "The species is scarely known to the east of North Carolina." Michener's List of Land Birds of Chester County, Penna. (*Agricultural Ornithology, 1863*) "A Southern species and rather scarce," Krider (*Forty Years Field Notes, 1878*) "Considered rare, I have found it in swampy woods, New Jersey, and mountains of Pennsylvania." From 1875 to 1878 we hear of it breeding locally, in New York, New Jersey, Pennsylvania and Ohio. Coues, (1878) "Eastern Province of the United States, especially in the Valley of the Mississippi, north to Connecticut Valley, west to Kansas and the Indian Territory." Maynard (1879) "Quite rare in the Eastern of the Middle States and does not occur in New England at all. The great stronghold appears to be in the West, along the Mississippi river, I have not met with it." During the early '80's the advance was wonderfully rapid; indeed Dr. Coues had confidently predicted its occurrence in New England sooner or later, long ago; while Chamberlain alone appears to have had no suspicion of it, as he says (1891) "It is most abundant along the Mississippi Valley and has been seen but rarely east of the Alleghanies." Locally, Rhoades mentions it breeding in Chester county in 1878 (*Bulletin Nuttal Ornithological Club, Vol. IV, p. 234*) and regarded it as one of the commonest representatives of its family. Eight years later, Jackson reports it a "frequent summer resident, in some localities may almost be said to be common" (*Ornithologist and Oologist. Vol. XII. p. 43*), and in 1889, Norris found it breeding abundantly (*Ibid, Vol. XIV. p. 104*). In this section the increase was enormous up to 1897, when the high water mark was reached and the Kentucky appeared to be about seventh in point of numbers, perhaps more numerous here than any other

part of its habitat. It actually overflowed its accustomed haunts of luxurient undergrowth, the bird associated with the spicewood, swamp cabbage, summer fern, mandrake and wild sarsaparilla, encroached upon the domains of the Ovenbird and the Blue-winged Warbler. The following year it fell to about one-half the preceding high total and yet ranked next to the Ovenbird in the Warbler family. It has since held its own, I can give no reason for the decrease. It is a matter of congratulation that this and other insect destroying species have so greatly multiplied and extended their ranges as to fill in a large measure the gaps made by the destruction of other beneficial species. I record 20, 24 and 21 pairs in the last three years. 42

52. **Maryland Yellowthroat** *Geothlypis trichas*. I have been accustomed to regard this bird as a swamp dweller exclusively until recent years, when I have found it skirting the second growth sprouts and attendant dense vegetation some distance from water. Two types of nests are known to me, the first a frail, thin, grass-built structure; and the other, high and well built of weed stems, grape-vine bark and dead leaves, lined with fine grass stems or strawberry runners, the cornicopia type. Six to nine pairs. 14

53. **Yellow-breasted Chat** *Icteria virens* Apparently one place is as good as another to the Chat, and it may usually be found more or less common according to the available briers, brambles and cedar brushes; apart from this it is occasionally somewhat uncertain in numbers. The average for the last three years is fourteen pairs. 28

54. **Catbird** *Galescoptes carolinensis*. Found anywhere except in the deep woods. An average of thirty-two pairs. 64

55. **Brown Thrasher** *Harporhynchus rufus*. As a small boy, I remember this bird as a familiar roadside frequenter; then for a number of years it sank to a very

low ebb, I occasionally noted it as tolerably common up to 1893, but not again until 1900, if five pairs in one square mile can be considered so. It builds in hedges, greenbriers and thorn bushes. Its rich song, beautiful form and inoffensive ways should make it an object of special protection. 10

56. **House Wren,** *Troglodytes aedon.* Quite a number of people have complained that they have not seen a Wren for years, while as a matter of fact they have been common enough the past few years at least, though often compelled to resort to the cavities and odd corners of outbuildings for breeding purposes. I have had no trouble to keep a pair about the garden by merely erecting a small box with an inch augur hole for entrance and narrow slits under the eaves to give it ventilation. The English Sparrow cannot get at it. I have found from ten to twelve pairs the last three years. 22

57. **White-breasted Nuthatch,** *Sitta carolinensis.* This square contains a poor representation in the breeding season, common at all other seasons however. One pair. 2

58. **Carolina Chickadee,** *Parus carolinensis.* Present in an old orchard. Common only in the fall and spring. I have never found its nest. 2

59. **Wood Thrush,** *Hylochichla mustelina.* Few birds are more often robbed of their eggs by the boy collector than this species. It is, I think, a little less numerous than formerly. In this neighborhood it is a bird of the woods and thickets exclusively; but like so many of our wood birds, it builds its nest not far from a road or opening. Twenty to twenty-one pairs. 40

60. **American Robin,** *Murula migratoria.* I once counted forty-five nests placed in shade trees on either side of an avenue in the short distance of two squares. Probably not more than two or three nests are built by a single pair in high or protected situations, while as

high as five nests are often required in exposed places. Thirty-seven pairs. 74

61. **Bluebird,** *Sialia sialis.* Abundant up to the fierce blizzard of February, 1895, when it became scarce for the two seasons following. It is again becoming common. The past two years I counted four pairs nesting. 8

62. **European House Sparrow,** *Passer domesticus.* This bird should be classed with the rats, mice and other vermin. I have repeatedly found its great rubbish pile of a nest in situations impossible for any of our native birds. In defence of the Martins, I have shot more than fifty would-be tenants; and have destroyed nest, eggs and young whenever possible to get at them, yet it is our most abundant bird. Approximately we have one hundred and six pairs, and under present conditions it has doubtless reached the limit of abundance. 212

We have a total of 1388 individuals, representing 62 species, which may be divided in the main as follows:

Insectivorous,	48 species.	1091 individuals.
Granivorous,	6 "	255 "
Frugivorous,	1 "	8 "
Carnivorous,	4 "	14 "
Omnivorous,	3 "	20 "

Only two species are positively injurious, the Cooper's Hawk and English Sparrow; and two more are on the doubtful list, the Blue Jay and Cedar Waxwing.

The following species were formerly present in the tract, but are now absent for one reason or another.

1. **Ruffed Grouse,** *Bonasa umbellus.* The last bird inhabiting this tract, was shot in November, 1889, and is now in my collection. Formerly common, but I doubt whether the length and breadth of the South Valley hills could now yield a single specimen. A few are yet to be found on the North Valley hills.

2. **Sharp-shinned Hawk,** *Accipiter velox.* Dr. W. E. Rotzell found a pair nesting in a small cedar grove in 1889. It has not occurred as a breeder since that time. It is rather uncommon as a summer resident in the county, I believe.

3. **Belted King-fisher,** *Ceryle alcyon.* I examined an occupied burrow in an iron ore pit, in 1894, and the birds deserted the spot. It is found sparingly along all streams of fair size.

4. **Whippoorwill,** *Antrostomus vociferus.* Not present as a breeder since 1887. Rather rare in this section for a number of years.

5. **Red-winged Blackbird,** *Agelaius phœniceus.* A few pairs nested in the larger swamp a number of years ago when it was more open. Found commonly in small colonies on either side of the ridge, in suitable places.

6. **Carolina Wren,** *Thryothorus ludivicianus.* One or two present in 1898, and I shot a moulting female early in September. Rather rare in the neighborhood.

Present in the immediate vicinity but nesting without the stated area, are several species as given below.

1. **Great Blue Heron,** *Ardea herodias.* A single bird, usually an immature, may frequently be found haunting the head waters of the Darby creek.

2. **Green Heron,** *Ardea virescens.* A pair in Devon swamp. Rather uncommon in this locality.

3. **Black-crowned Night Heron,** *Nycticorax nycticorax nævius.* Large colony in the valley, within a few miles.

4. **Bartramian Sandpiper,** *Bartramia longicauda.* Present on either side of the ridge but rather rare.

5. **Spotted Sandpiper,** *Actitis macularia.* Found just without the tract. Not uncommon.

6. **Turkey Vulture,** *Cathartes aura.* Often found within my boundaries but does not nest nearer than Paoli and Valley Forge.

7. **Red-tailed Hawk,** *Buteo borealis.* It is a rather curious fact that I have never found this large Hawk breeding on the Valley hills. It is common in the grove timber to the south of us.

8. **American Barn Owl,** *Strix pratincola.* Found in the large timber near the head of Darby creek, a mile from Berwyn. Rather rare.

9. **American Long-eared Owl,** *Asio wilsonianus*: Has been found recently nesting near Paoli and at Valley Forge by Dr. W. E. Hughes, Rare.

10. **Great-horned Owl,** *Bobo virginianus.* The same remarks might be made in regard to this species as to the Red-tailed Hawk.. It is rather uncommon.

11. **Hairy Woodpecker,** *Dryobates villosus.* I have found it but once within this tract. Rare in this section.

12. **Grasshopper Sparrow,** *Ammodramus savannarum passerinus.* Found nesting at Daylesford. Not uncommon.

13. **Rough-winged Swallow,** *Stelgidopteryx serripennis.* Present in the valley. Common.

14. **Louisiana Water Thrush,** *Seiurus motacilla.* A pair discovered in 1899, half a mile beyond the limits of the block.

Thus eighty-two of the ninety-odd species breeding in the county are accounted for. The most notable of the missing ones are the Cliff Swallow, and Tufted Titmouse.

Excluding man and certain domestic animals, the greatest destroyers of our feathered friend, appear to be the fox, weasel, red squirrel and black snake; and probably the most critical period of its existence is immediately after it has left the home nest.

We would be better prepared to realize the enormous number of birds in a given area, if we would stop to consider that 1280 individuals to the square mile would mean but a single pair to the acre; certainly a very small force to battle against the destructive rodents, innumerable noxious weeds, and myriad insect life.

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